Indigenous Archaeological Approaches to Artifact and Household Analysis at Precolonial Yup'ik Village *Temyiq Tuyuryaq* (Old Togiak)

By

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Abstract

Upper Bristol Bay is home to a multitude of precolonial-and colonial-era villages dotting the coast, islands, and rivers. The bay's dynamic history remains relatively unexplored in archaeological literature. Current data situate people in the region for nearly 6000 years, living in complex, semi-permanent villages, subsisting on large land and sea mammals, fish and mollusks. One such village is *Temyiq Tuyuryaq* or Old Togiak (GDN-00203). The village is a mounded accumulation of household cycles, sand and organic materials atop an accreting sand spit in the Togiak Bay. Ancestral to *Nutaraq Tuyuryaq* [New Togiak], the village directly links precolonial and modern Yup'ik traditions in the Upper Bristol Bay.

Yup'ik traditions are a combination of transformation, continuity and resilience. Yupiit worldview seeks balance and co-existence with many life forms including the spiritual, natural and human. The aim of this research is to intersect traditional Yup'ik values, knowledges and histories with archeological theory and methodology to explore the material culture and households of *Temyiq Tuyuryaq*. Research objectives include evaluating a sample of the culturally modified materials, assessing the built environment and exploring the Little Ice Age as causation for increasing village complexities.

Research results indicate that there is a direct continuity of knowledge spanning at least 600 years in the bay. Artifact production and function remain primarily continuous with intensifications of some materials circa 500 cal BP. Household analysis reveals the importance of the *ena* [family house] for processing foods and cooking activities. Additionally, the research indicates that the Little Ice Age may not have had an extensive impact on tool and household function. Rather, the results suggest that the Yup'ik Bow-and-Arrow War had more extensive impacts on the villages about 600 cal BP. This thesis explores the complex relationship of Indigenous knowledge and archaeological data, as well as discussing the dynamic and continuous relationships that modern Yup'ik people of Bristol Bay have to their histories.

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Chapter 1

Introduction

The research presented in this thesis draws from aspects of Yup'ik worldview to interpret archaeological contexts. Yup'ik scholar and cross-cultural studies professor, Oscar Kawagley (2009:8) defines Indigenous worldview as enabling "its possessors to make sense of the world around them, make artifacts to fit their world, generate behavior, and interpret their experiences." Dr. Kawagley (2009:8) also states, "…as with many other Indigenous groups, the worldviews of the traditional Alaska Native peoples have worked well for their practitioners for thousands of years." According to Dr. Kawagley's definition, worldview influences the shared human experience and generates specific behavior that, in turn, produces the artifacts necessary to fit that behavior. Worldview then affirms the reproduction and transformation of artifacts for many generations. In this research, I draw on Kawagley's (2009) definitions and suggest that the key to interpreting artifacts and the human experience is by exploring cultural worldview.

Interpreting behaviors associated with historical or precolonial worldview can be accomplished with Indigenous archaeological paradigms. Indigenous theoretical and methodological frameworks define research questions, categories of analysis, and interpretations to reflect Indigenous worldview and values. In archaeological research, Indigenous frameworks associate traditional worldviews with their precolonial predecessors, which generates a nuanced and holistic interpretation of the past.

This thesis draws from aspects of Indigenous archaeological frameworks and standard archaeological analysis to interpret precolonial tool function and the built environment at the *Temyiq Tuyuryaq* [Old Togiak] village. *Temyiq Tuyuryaq* is a precolonial-colonial (1300-50 cal BP) era village in the Upper Bristol Bay of southwestern Alaska. The current village, *Nutaraq Tuyuryaq* [New Togiak], is located across the bay from the old village (Kowta 1963). Precolonial *Temyiq Tuyuryaq* is a multi-component, semi-sedentary village. While most present *Tuyuryaq* residents live year-round in the current village, multiple modern cabins at *Temyiq Tuyuryaq* are occupied occasionally (Barnett 2018). The *Temyiq Tuyuryaq* village is a mounded accumulation of sand, organic materials, house cycles (building, abandonment and rebuilding), external features and cultural relics stretching approximately 75 x 180m. However, it was undoubtedly much larger before the cannery's construction at the southern end of the spit in 1844 (Barnett 2018).

University of California Los Angeles (UCLA) doctoral student, Dr. Makato Kowta, was the first researcher to excavate a portion of *Temyiq Tuyuryaq* in 1960 for his dissertation (1963). Dr. Kowta's objectives were to expand on upper Bristol Bay's "scanty ethnographic data." He concluded the excavated materials were fill (discarded village artifacts) and that the lack of sea mammal remains and summer hunting materials in the later occupation suggested diminishing sea resources and a primarily winter occupation (Kowta 1963).

In 2015, researchers from the University of Montana conducted a mapping, geomagnetometry, geophysical and paleoethnobotany core sampling study (Prentiss and Barnett 2017). The 2015 research identified village boundaries, radiocarbon dates, and certain botanical and faunal resources. Interpretations drawn from University of Montana's research refuted the mound as a midden structure and stated the village was never abandoned (Kowta 1963; Prentiss and Barnett 2017). The Togiak Traditional Council and Dr. Kristen Barnett (Bates College), have since developed a long-term, collaborative archaeological project (Barnett 2018).

According to archaeological literature, Yup'ik, people are the descendants of the Thule Tradition (Dumond 1984, 1995, 2003, 2009; Frink 2016; Mascnher and Jordan 2008; Mashner *et al.* 2009; Shaw 1998). Archaeologists hypothesize that the bearers of Thule cultural material spread south from the northwestern arctic circa 1500 BP and replaced the previous Norton Tradition in southwestern Alaska circa 1200 BP (Ackerman 1988; Darwent and Darwent 2016; Dumond 2000, 2009, 2016; Fitzhugh 2016; Friesen and Arnold 2008; Frink 2016; Maschner *et al.* 2009; Schaaf 2017; Schaaf *et al.* 2007). Thule artifacts indicate an adaption to extensive whaling, use of a complex *cavek* [harpoon] system, *kenukcuk* [clay oil lamps], and *cungapak* [labrets] (Ackerman 1998; Dumond 2003, 2005, 2009; Freison and Arnold 2008; McGhee 2001; Morrison 1989).

The Thule lived in semi-sedentary villages, consisting of distinct household structures. Remains of residents are semi-subterranean, multi-room structures containing long entryways connected to exterior storage rooms, large main rooms with raised wooden benches, and connected side rooms for cooking, storage, and sleeping. Semi-subterranean houses were often connected through tunnel systems; and were constructed from whalebones, stones, driftwood, and sod (Ackerman 1984; Darwent and Darwent 2016; Dumond 2009; Ford 1959; Vanstone 1968, 1970).

There are points of continuity and change between the ancestral Thule and Yup'ik artifacts and villages. Yup'ik artifacts indicate an expanding fishing industry composed mainly of ground slate tools (Dumond 1984, 1995; Fienup-Riordan 2007; Fienup-Riordan *et al.* 2015; Schaaf 2017). Precolonial Yup'ik villages were semi-sedentary and typically contained multiple semi-subterranean house structures. Generally, multiple smaller *ena* [family houses] surrounded one or more large *qasiq* [men's communal house/ceremonial house]. All houses had a *kalvagyaraq* [subterranean entryway], which provided entry to house through a square hole near the central hearth. In the q*asiq* [men's communal house] there was one large main room, with interior benches along the wall and a *kenilleq* [central hearth], covered by logs and used for steam bathing. The *ena* [family house] was normally rectangular with one room and a sunken middle for a hearth. Soil along the wall was raised and padded with matts for sleeping (Fienup-Riordan 2007; Frink 2016). Houses were built from bones, driftwood, rocks, woven grass, and sod (Fienup-Riordan 1983, 2007; Frink 2016; Ross 1958).

Archeological and ethnographic research establish continuity and change in the artifacts and the built environment between bearers of the Thule Tradition material culture and the descendant Yup'ik culture in coastal southwestern Alaska. Current arguments attempting to account for the cultural variation include, environmental adaptability strategies, warfare, and cultural transmission circa 500 cal BP (Bundy 2007; Dumond 1984, 1982, 2000, 2003, 2009, 2016; Fitzhugh 2016; Friesen and Arnold 2008; Knecht and Davis 2008; Lech *et al.* 2011; Maschner 1999; Maschner and Hoffman 2003; Maschner *et al.* 2009; Mason 2016; Shaw 1983). The goal of this thesis is to analyze the artifacts and the built environment at *Temyiq Tuyuryaq,* to determine tool functionality and to identify household activities throughout the excavation. The research then provides explanations for the variability in the archaeological record based on Yup'ik knowledge, and current archaeological, botanical and oceanographic research in southwestern Alaska.

1.2 Disclaimers, Terms and Definitions

Before continuing, an autobiographical introductory statement is necessary to understand my position and potential biases impacting this thesis as a non-native researcher applying an Indigenous archaeological framework. I spent my childhood in the small southern Idaho town of Fairfield, Idaho exploring the high desert sagebrush and dry forests of the Rocky Mountains

between the Snake River Plain and the Soldier Mountains. The population of Fairfield is around 400 and the community is predominately Caucasian, myself included. I was raised the daughter of a Norwegian immigrant on my father's side and of cattle ranchers on my mother's.

A mentor and now advisor, Dr. Kristen Barnett, introduced me to Indigenous archaeological frameworks and guided me when applying these theories and methodologies in my own research. Although non-Indigenous, I am an advocate for understanding the human experience in precolonial America through an Indigenous lens.

Following a Yup'ik theory and methodology, all place names, tools, animals and ideologies are written in *Yugtun* [Yup'ik language] first, followed by the English definition in parentheses. Language is a fundamental aspect of a culture. Without providing a lingual understanding, it is impossible to comprehend where the people come from. Meaning can stem from the way words are said to the way a sentence is constructed. By contemplating the meaning behind words the traditional preferences, values and ideologies can be better explored (Barnett 2015; Charles personal comm. September 2017). Sources for Yugtun in this thesis include Steven A. Jacobson's *Yup'ik Eskimo Dictionary* (2012), the Bristol Bay Place Names Map, books compiled from interviews with Yup'ik Elders (Blue 2007; Fienup-Riordan 2007, 2012; Fienup-Riordan *et al.* 2015; John 2003; John 2010), personal communication with *Tuyuryaq* community members (Yanez personal comm. May 2017) and from courses taught by Yup'ik professors, Dr. Theresa John (*Oral Traditions and Research*) and Dr. Walkie Charles (*Yugtun*). If I did not find the names using these sources, I only provided the English name. Additionally, the pluralization of words is not provided because of my lack of extensive knowledge in *Yugtun* [Yup'ik language].

1.3 Research Design

1.3.1 Objective One

After years of collaborative work between Dr. Barnett (Bates College) and *Tuyuryaq* residents, a community member inquired about the possibility of rewriting what that 'old man' (referring to Dr. Kowta) wrote about *Temyiq Tuyuryaq* (Barnett 2018). The Togiak Traditional Councils major points of contention with Dr. Kowta's interpretation of the old village was labeling the site a midden structure and the assumption that the precolonial people abandoned the land. Furthermore, Dr. Kowta (1963) suggested that spring, summer, and fall hunting tools diminished in the later village occupation and that the quality of the artifacts deteriorated,

indicating the people were struggling to survive. Kowta's (1963) dissertation concluded that the occupants moved inland and closer to more abundant resources. The artifacts removed from *Temyiq Tuyuryaq* were another community concern; where did the materials go, and what was said about them?

Although unable to erase the 1963 publication, Dr. Barnett reassured the community member that future archaeological interpretations would be collaborative and would rest in Yup'ik values and voices. In contrast to Kowta's (1963) interpretations, the work conducted in 2015 by the University of Montana situated the Temyiq Tuyuryaq mound within a village context and described the landscape as in continual use (Barnett 2018; Prentiss and Barnett 2017).

In addition, Dr. Barnett managed to locate the artifacts initially collected from the village site during the 1960's at the University of California Chico and the University of Alaska Fairbanks. The non-accessioned artifacts from Chico were returned to *Tuyuryaq* and housed in the local cultural center. The artifacts from Fairbanks were located in 2017 for this project.

Founded in the community's interest to locate and reanalyze 1960's the material remains from the village site, the first objective of this research is to (1) redefine the excavated material (Kowta 1960, 1963) following a Yupiit-based interpretation, (2) analyze production and functionality of the material remains and (3) explore patterns of continuity or change of the culturally modified material over time. This research will test the conclusions established in Kowta's (1963) dissertation. If there was a decrease in sea mammal hunting in favor of terrestrial mammal hunting over time at the village site, then the archaeological record should reflect this behavior with a decrease in sea mammal hunting tools and an increase in terrestrial mammal hunting implements. Furthermore, if the site was primarily occupied during the winter, as suggested by Kowta (1963), then the artifact assemblage should contain a greater quantity of winter-related technology. Last, this research will evaluate the continuity of behavior related to the production and function of tools over time and will provide an enriched and holistic interpretation of the artifact assemblage based directly on Indigenous knowledge

1.3.2 Objective Two

The second research objective is to analyze the built environment and offer new interpretations not provided in the 1960's (Kowta 1963). The built environment is a social

construct, that shapes the behavior of the people living within it, relaying information about relationships, economy, politics, and religion in a community. In turn, symbols in the built environment reflects the social norms required in each household, thus reflecting socially defined culture roles. The culture roles are then passed onto the next generation (Rapoport 1990). Dr. Kowta (1963) interpreted the remains and features excavated at the village as a midden consisting of fill material, discarded household items, wood and food. However, villages in the region are generally accumulations of household cycles, consisting of construction, use and abandonment. (Barnett 2018; Dumond 1981, 1995, 2003; Fienup-Riordan 2007; Frink 2016; Schaaf 2017). In this thesis, I test whether the excavated portion of the village originated from a midden (an accumulated trash pile) or from fill related to cycles of household building, use and abandonment. Furthermore, if the remains are associated with household cycles, then this research will evaluate the remains to determine if temporally distinct occupations, features and activity areas can be defined.

1.3.3 Objective Three

The third and final objective of this research addresses broader questions concerning human interactions and impacts on the environment of precolonial Bristol Bay. In particular, this research aims to situate the village within Bristol Bay's broader precolonial context through analysis of tool kit change over time in response to possible cooling climatic conditions.

Between 500-200 cal BP, a global climatic cooling event termed the Little Ice Age led to a roughly 0.8°C decrease in average annual temperatures (Jordan 2008), which in turn led to increased salmon and sea mammal migrations. The influx of coastal resources is reflected in the archaeological record at village sites with the intensified focus of hunting tools, house production, and corporate village structure (Jordan 2008; Mascher and Jordan 2008; Misarti and Maschner 2015). In this research, I test whether the material remains at *Temyiq Tuyuryaq* reflect an expanding sea hunting and fishing industry and simultaneous decrease in land mammal hunting, which could support the hypothesis for an increase in sea mammal and fish resource availability as a result of the Little Ice Age.

Additionally, the project explores the possibility of increased village social complexity and sedentism, and the relationship between the archaeological record and expanding Thule material in Bristol Bay. The timeline of the Thule expansion in the bay has been sparingly

explored and the information that we do have is primarily derived from the *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] and *Nuvupigaq* [the Alaska Peninsula and the Aleutian Islands] (Ackerman 1964, 2008; Bailey 1991; Dumond 1981, 1995, 2003; Maschner 1999; Maschner and Hoffman 2003; Ross 1971; Shaw 1983; Steffian *et al.* 2016; Vanstone 1968).

1.4 Thesis Organization

This thesis is organized into nine chapters. Chapter two provides the framework for the study, exploring Indigenous archaeological theories and methodologies. Chapter three explores the regional background relevant to the study, including the Yup'ik seasonal cycle, the local flora and fauna and the precolonial history of the Bristol Bay region. Chapter four contextualizes the history of archaeological research at the *Temyiq Tuyuryaq* village. Chapter five outlines the methodology and methods of the study including the artifact and household analysis. Chapter six provides the results including radiocarbon dating, culturally modified *teggalquq* [stone], culturally modified faunal organics, culturally modified *murak* [wood] and pottery. Chapter seven provides the results of the activity systems analysis. Chapter eight discusses the production, use and discard of the material remains, as well as, the interpretation of activity areas and the possible effects of climate change on the *Temyiq Tuyuryaq* residents. Chapter nine explores research implications including, testing Kowta's (1963) interpretation, situating *Temyiq Tuyuryaq* in place and time and discussing possibilities reaching beyond climate change to prompt cultural transformation.

Chapter 2
Project Framework:
Indigenous Archaeological Theories and Household Analysis

To interpret the *Temyiq Tuyuryaq* material remains and the built environment, this research applies a multifaceted approach. Interpretations come from diverse lines of evidence including Yup'ik oral histories, language, traditions, ethnographic literature and standard archaeological analysis. The diverse analysis provides a nuanced and holistic interpretation of the livelihood at the *Temyiq Tuyuryaq* village.

Broken into three sections, chapter two first explores Indigenous archaeological paradigms, examining archaeology's history as a colonial practice and addressing issues relating to Indigenous archaeological theory. The second section defines Indigenous methodologies and explores the Yupiit-based model created for this project. The third section provides the history of archaeological household analysis and the analysis used for this project.

2.1 Indigenous Archaeological Theories

> "It is clear that in practice, archaeology is much more than simply a tool for understanding the past: archaeological practice and the knowledge it produces are part of the history and heritage of living people and have complex contemporary implications and relevance for those people in daily life." (Atalay 2006: 283).

Indigenous archaeological theories focus on the values, preferences, languages and livelihoods of native communities pertaining to the interpretation of human history (Atalay 2006; Barnett 2015; Murray 2011). Indigenous archaeological theories address the decolonization of the Western academic perspective, making archaeology more relevant to Indigenous communities, focusing on the rights Indigenous people have to their material and intellectual heritage and broadening the perspective of standard archaeological interpretation (Atalay 2006; Barnett 2015; Colwell-Chanthaphonh *et al.* 2010; Silliman 2010; Smith and Wobst 2005; Watkins 2003, 2005, 2011). Colwell-Chanthophon *et al.* (2010: 299), a group of diverse

Indigenous archaeologists, state that Indigenous archaeology is "fundamentally about an array of archaeological practices undertaken by, for and with Indigenous communities in ways that challenge the discipline's historical political economy and expand its intellectual breath…Includ[ing] numerous practices and approaches."

The decolonizing paradigm directly confronts the bias of interpreting history through a primarily Western academic framework, essentially ignoring the worldview and knowledge systems of Indigenous descendant people. Focusing on decolonizing frameworks generate new methodological systems for archaeological interpretation founded in Indigenous values, traditions, and language, forming a more nuanced and holistic understanding of human history (Barnett 2015; Silliman 2010; Smith 2006).

Decolonizing frameworks involve multivariate approaches including collaboration and inclusion of Indigenous people's beliefs and ideals into the research process. Inclusion into the process, results, and dissemination of projects aids in making archaeology more relevant to Indigenous communities and fosters respectful relationships between communities and universities, supports diversity in the discipline and widens archaeological breadth of knowledge (Barnett 2015, 2018; Colwell-Chanthaphonh *et al.* 2010; Gonzalez 2016; Silliman 2010; Watkins 2011).

Indigenous archaeologies address problems of ownership and intellectual property rights (Watkins 2005). The removal of cultural materials and bodily remains distance native communities from their heritage physically and intellectually (Murray 2011). By separating contemporary Indigenous knowledge and materials from their ancestors, researchers create an image of discontinuity, effectively preventing descendant populations from having the ability to tell their own histories within a large forum (Barnett 2015; Murray 2011). Indigenous archaeologies support the rights of Indigenous people to their historical property and recognize the intellectual rights Indigenous communities have to archaeological research as the expert knowers of their own history.

Lastly, Indigenous archaeologies support a widening scope of research. Although decentralization of the Western academic framework is an essential issue to Indigenous archaeological theory, it does not attempt to separate itself from scientific archaeology, rather it complements the approach to enrich and diversify archaeological interpretation (Barnett 2015; Silliman 2010; Watkins 2005, 2011). Joe Watkins (2011: 51), Choctaw scholar, describes

Indigenous archaeology as "an expression of archaeological theory and practice in which the discipline intersects with Indigenous values, knowledge, practice, ethics, and sensibilities, and through collaborative and community-originated or directed projects and related critical perspectives" rather than a complete dismantling of the scientific field. Indigenous theory is complementary in that it draws from diverse lines of evidence including Indigenous values, perceptions, and knowledge to produce interpretations about history and continues to look upon the evidence with a critical eye.

Not only does Indigenous theory broaden archaeological breadth of knowledge, but it creates a more accurate representation of history. Archaeologists look to categories of analysis that include of geology, botany, zoology, DNA, statistical analysis, ethnographic analogies and historical documents to create a story of precolonial people, yet often do not include the perspectives of the very descendants of the people whom made the sites and tools. The inclusion of native perspectives, as expert knowers and traditional knowledge holders, aids in understanding the worldview through the eyes of the people living in the sites. Kristen Barnett (2015:80) Unangax archaeologist, describes Indigenous archaeologies as "provid[ing] an opportunity for archaeologists to look deeper into the past and apply a methodology that incorporates the who, allowing for a greater visibility into the people whom we know to have existed but often struggle to see."

Archaeology serves as a tool to explain human behavior and livelihood at precolonial sites. The Western world looks to archaeologists as the expert knowers of precolonial history, with right to remove artifacts from sites and study these artifacts using Western-based analysis, which inadvertently displaces Indigenous peoples as expert knowledge holders (Smith 2006). Displacement of Indigenous people from their ancestor's homes, artifacts, and bodily remains, allows archaeologists unfettered control of the artifacts and interpretations of the past. Indigenous activists fight to have the same rights to the physical artifacts and they question the accuracy of the archaeological discipline (Atalay 2006; Bruchae *et al.* 2010; Bruning 2006). Few archaeologists, Indigenous and non-Indigenous, have begun the steps to include Indigenous voices within the field (Barnett 2015; Echo-Hawk 2000; Gonzalez 2016; Panich 2013).

This thesis draws from aspects of Indigenous frameworks, centralizing Yup'ik oral traditions, language and values to make conclusions about the ancestral remains. Centralizing Indigenous worldview both contests and complemens western constructs of standard

archaeological analysis. As an aspect of the research process, I twice visited the Tuyuryak community and conducted interviews with residents. I also worked with a local student, Selena Lockuk to collect and disseminate information about *Temyiq Tuyuyraq.*

2.1.1 Archaeology as a Colonizing Discipline

The history of the archaeological discipline places Indigenous knowledge and worldview on the fringe of research. The foundation of early North American archeology perpetuates manifest destiny, promoting imperialism on native lands, communities and customs (Smith 2006; Trigger 2006; Watkins 2005). The culture history theoretical perspective relies on artifact typologies to describe how native cultures changed and adapted throughout the past. This perspective is normative and over-generalized past lifeways, which constrained Indigenous peoples to be simple products of their artifacts (Trigger 2006). This perspective was followed by historical particularism in the 1940's, coined by anthropologist Julian Steward, which placed Indigenous people inside an environmental box—stating people were solely the products of their environments. Since then, archaeologists have argued for the environment as a major cultural mover with human behavioral ecology theories (Bird and O'Connell 2006).

The 1960's saw an archaeological paradigm shift coined the processual movement, which was associated with the application of middle-range theory (Binford 1962, 1978; Trigger 2006). Middle-range theory and the processual movement relied on observations, interviews, and ethnoarchaeological research with Indigenous people to create analogies of precolonial adaptation to the environment and to understand how people used material culture as a survival mechanism (Binford 1978). Though the processual movement promoted the Indigenous community involvement, archaeologists continued to ignore the traditional mechanisms for understanding the past, focusing primarily on Western constructs. Processual archaeologists considered oral traditions, dances, songs, histories on the fringe of research and did not understand that these data sources can complement a scientific research perspective (Smith 2006).

Indigenous theory and methodology gained attention during the American Indian Movement (AIM) of the 1960's. A chief component of the movement was protesting the excavation and display of Native American human remains (Atalay 2006, 2012). The people of the AIM demanded to take a primary role in how their ancestors and important cultural remains

were treated. During this movement, Indigenous American's critiqued archaeological research goals and practices, which forced actors of the discipline to reconsider their research approaches, aims, and goals (Atalay 2012). Indigenous archaeological theory illuminates biases caused by standard archaeological interpretation by giving equal consideration to the Indigenous perception of history and placing Indigenous knowledge at the heart of the project rather than the fringe (Conkey 2005; Wilson 2008). By placing Indigenous knowledge at the center of the project, Indigenous archaeology makes the discipline relevant for Indigenous peoples and promotes respectful relationships between academic institutions and Native communities (Gonzalez 2016; Smith 2005).

On November 16, 1990, thirty years after AIM began, the Native American Graves Protection and Reparation Act (NAGPRA) was passed into law (Pensley 2005). NAGPRA gave affiliated tribes, officially recognized by the United States Government, the right to reclaim and repatriate human remains, funerary objects, sacred items and cultural patrimony (Pensley 2005). Despite NAGPRA's promises to Indigenous communities, the looseness of the term 'affiliation' diluted the law. To be considered affiliated, individuals had to "trace his or her ancestry directly and without interruption by means of the traditional [Western] kinship systems" (National Parks Service 2013). Evidence for cultural affiliation included geographical proximity, kinship, biological relation, archaeological, anthropological or linguistic evidence, folklore, oral tradition, historical and other expert opinion. While these categories allowed some Indigenous communities to become officially recognized by the United States Government, Western academic researchers still had the final say in the decision-making process and Indigenous knowledge and understanding of lineage and genealogy was primarily ignored (Echo-Hawk 2000; Pensley 2005).

2.1.2 The Legitimacy of Indigenous Archaeologies

In 2008 Robert McGhee questioned the legitimacy of Indigenous archaeological theories in "Aboriginalism and the Problem of Indigenous Archaeology." McGhee's (2008) remarks continue to open a welcome conversation into the concerns facing Indigenous archaeological research. The article primarily addresses the concern that the objectivity of archaeology would diminish if its theoretical foundation is based on "oral traditions, religion, or the imaginative use of other forms of information" (McGhee 2008: 580). McGhee (2008) suggests that Indigenous

archaeologists diminished the rigor of the scientific process because of the desire to correct historic economic disparities rather than conduct meaningful research (McGhee 2008).

Although McGhee (2008) has valid critiques of Indigenous methodologies, it is important to note that archaeology, though striving to be scientifically objective, will always be subject to the biases of its theoretical and methodological foundation (Smith 2006; Walter and Anderson 2013). The researcher's standpoint, social position, epistemology, axiology and ontology can skew the project's framework (Walter and Anderson 2013). Indigenous archaeological theories openly confront the impact that individual perspectives can have on the research outcome and emphasize Indigenous worldviews as the main line of evidence. Rather than skewing the objectivity of the research the theoretical foundation is explicit in its research focus.

McGhee (2008) also criticizes Indigenous paradigms as not globally relevant because Indigenous archaeologists explicitly align their reports with the historical interests of specific communities. Although each Indigenous project creates a methodological foundation on a case-by-case basis to focus the values, wishes and worldviews of specific Indigenous communities, the goals of Indigenous archaeological theories remain consistent. The goals include decolonizing paradigms, making archaeology relevant for communities, discussing property and intellectual rights and widening the scope of research inquiry to include Indigenous worldviews (Atalay 2006; Barnett 2015; Croes 2010; Colwell-Chanthaphonh *et al.* 2010; Silliman 2010; Smith and Wobst 2005; Watkins 2011). By aligning reports with specific groups, the research process does not diminish because the method is explicit in its alignment. Although the processes of investigation may lay in a case-by-case basis, the underlying issues and goals of an Indigenous methodology remain universal.

McGhee (2008) also questions the integrity of research aligned with one group in contested space or time, assuming that by choosing one group the author uses an uncritical judgement in evaluating deep history. Indigenous mechanisms for survival integrate an understanding of the deep history of their communities taught through generations of oral traditions, rituals, art, language, dance and other means (Colwell-Chanthaphonh *et al.* 2010; Conkey 2005; Echo-Hawk 2000; John 2010; Kawagley 2009; Watkins 2011). Analyzing these ways of knowing, tied with the physical evidence in archaeological sites, is itself a critical evaluation of precolonial histories. The evaluation of material remains based on an Indigenous

group's understanding of their histories widens the scope of inquiry, rather than analyzing the data with singularly western-based values and knowledge.

McGhee (2008) then questions Indigenous traditions as legitimate source of archaeological information. He indicates that culture changes too much through time to be represented accurately by descendant population, suggesting that Indigenous people are as removed from the past as the archaeologists themselves. McGhee (2008: 583) states that, "cultures have changed and are not as connected to specific locations as Indigenous archaeology would make people believe; thus, they cannot know the past in its entirety. Indigenous archaeology is under the belief that culture is unchanging, when archaeologists and history knows this is untrue." Although specific mechanisms of survival may have changed over time, the universality of Indigenous values (respect, reciprocity, balance, and holism) and knowledge regeneration is a testament to the strength of Indigenous traditions across time and space (Archibald 2008). Thus, Indigenous worldview creates analogies of the past and specific mechanisms of remembering and oral traditions are viewed with a critical eye to evaluate historical events and realities.

Echo-Hawk (2000), Pawnee Archaeologists, argues that oral traditions are useful to decipher ancient history if evaluated critically for reliability and reasonability using a range of useful analytical tools. Reliability of the oral tradition is the compatibility of the story to the general context of human history derived from other evidence. Reasonability is evaluating if the oral tradition provides a perspective of historical events that would be accept by a reasonable observer (Echo-Hawk 2000).

As well as using oral traditions to understand specific events in time, oral traditions can create analogies of how Indigenous people viewed themselves, their world, their preferences, and values (Echo-Hawk 2000). These perspectives evaluate how people would behave in specific contexts. The analogies can draw on a wide array of supporting evidence, including archaeological, oral traditions, epistemological and linguistic (Barnett 2015; Colwell-Chanthaphonh *et al.* 2010, Watkins 2005, 2011).

McGhee (2008: 591) then argues that "Indigenous archaeology strips archaeology of the scientific attributes that make it a particularly powerful narrator of the past by giving equal weight to oral tradition and religious discourse." Furthermore, McGhee (2008: 588) claims that Indigenous archaeology promotes native essentialism and considers Indigenous people as

morally superior "because of their unique attributes, their extraordinary and holistic understanding of environments, cyclical time, spiritual realization, and that oral traditions provide all the information require to preserve the ancient world."

Indigenous archaeologists inversely argue that giving equal weight and consideration to oral traditions and traditional ways of knowing widen scope of research and create a nuanced picture of human reality (Croes 2010; Silliman 2010; Watkins 2011). Emphasizing traditional realities including oral traditions, language, songs, art and dance bring archaeology closer to the people who built the sites and artifacts. Indigenous people share undeniable attributes across space (Archibald 2008) and these attributes are seen through traditional mechanisms of knowing the world (Conkey 2005).

2.2 Indigenous Archaeological Methodologies

This project draws from aspects of Indigenous archaeological methodologies and includes Indigenous ways of being, knowing, and doing in everyday life to reflect Yup'ik worldview, values, and preferences. Reshaping the research expands standard archaeological lines of evidence and creates an interpretation that reflects the livelihood of the people living in *Temyiq Tuyuryaq.* Indigenous Tasmanian professor Maggie Walter and Michif professor Chris Anderson, proponents of Indigenous quantitative methodologies, frame the research method as a "technique for gathering and analyzing information, such as a survey or content analysis," while methodology is "the theoretical lens or worldview through which research is understood, designed and conducted" (Walter and Anderson 2012: 41-42). According to Walter and Anderson (2012), the methodology frames why research questions are asked over others and reflects the authors research standpoint (epistemology, axiology, and ontology), socio-economic and cultural position and the research methods. Methodologies are the active component in determining how and why research questions are asked, how the data is interpreted and how the information is disseminated (Cochran *et al.* 2008; Walter and Anderson 2012; Wilson 2008).

Indigenous methodological frameworks redefine the research questions, methods, interpretations, and dissemination to be "grounded in Indigenous ways of being, knowing, and doing in everyday life" (Waters and Anderson 2012: 58). Grounding this thesis in Indigenous worldview supports research questions reflecting community interests, shapes aspects of data collection and analysis to reflect Yup'ik worldview and provides a Yup'ik-based interpretation.

Indigenous methodologies center this thesis research in Indigenous values and ideals, which provides a nuanced interpretation of the material remains and the built environment at the *Temyiq Tuyuryaq* village site. Indigenous methodologies also supply a glimpse into the change or continuity of the people living in and building the villages.

To reframe this research, this project examines Yup'ik oral traditions, language and art. References used in this thesis include interviews, literature from Yup'ik Elders, scholars and ethnographic work. During an intergenerational class I attended in 2017 *Nutaraq Tuyuryaq* [New Togiak], Elders gathered and provided statements about the old village, while I individually interviewed Evelyn Yanez of *Tuyuryaq*. The interviews provide information about the timeline at the old village, reasons for moving to the new village, subsistence and lifeways in the old village.

References for Yup'ik oral traditions include a book of stories told by *Tuyuryaq* Elder, Annie Blue and stories by Toksok Bay Elder, Paul John (Blue 2007; John 2003). Furthermore, this project draws on research conducted by Yup'ik scholars, including *Yuraryararput Kangiit-Llu: Our Ways of Dancing and Their Meanings*, Dr. Theresa Arevgaq John's Dissertation (John 2010), and *A Yupiaq Worldview: Pathway to Ecology and Spirit* by Dr. Angayuqaq Oscar Kawagley (Kawagley 2006). Ethnographic research includes works by Ann Fienup-Riordan, Liam Frink, Frances Ross, Wendell Oswalt, and Edward Nelson (Fienup-Riordan 2007, 2012, 2016; Frienup-Riordan *et al.* 2015; Frink 2007, 2009, 2016; Nelson 1989 [1899]; Oswalt 1990; Ross 1958). Work by Fienup-Riordan and Frink supplies information based on current Elders perspectives, worldview, and histories, which complements older works by Ross and Oswalt that informs on daily lives of Yup'ik people. Nelson's work provides information on historical Yup'ik lives as seen through a colonial explorer perspective.

In most Indigenous communities, oral traditions are a foremost factor of learning, information sharing, and worldview (Archibald 2008, Basso 1996; Echo-Hawk 2000; Grele 2007). Pawnee archaeologists, Roger Echo-Hawk relates "in oral traditions, we can hear echoes of the actual voices of the people who made those artifacts and who were the original owners of the skeletons…it has become increasingly difficult to ignore arguments that historical information has been preserved through verbal means for great lengths of time" (2000: 285).

Yup'ik oral traditions are related in three story types including, *qanruyutet* [advice stories], *qullirat* [ancestor's accounts of Yup'ik origin] and *qanemcit* [personal accounts and activities] (Blue 2007; John 2003; John 2010). To explore Yup'ik values and histories, I

examined *qanruyutet* [advice stories] and *qullirat* [ancestor's accounts of Yup'ik origins]. The first story type I examined was *qanruyutet* [advice stories], which determines *alerquutet* [the social and cultural values that dictate being a proper Yup'ik person] (John 2010). Examining *qanruyutet* [advice stories] places the research in Yup'ik values and ideals.

Annie Blue in *Cikmiumalria Tan'gaurluq Yaqulegpiik-llu* [Blind Boy and the Arctic Loons], supplies an example of a qanruyutet [advice story]. This story tells of a grandmother and grandchild living together near a pond. In this pond there are two loons whom the young man befriends. According to the *qanruyutet* [advice story], the young man catches a lot of game which his grandmother butchers and prepares. The young man also feeds the loons with this game. After complaining about all the work she must do to prepare game, the grandmother concocts a mixture and blinds the young man as he sleeps. Immobilizing the young man, the grandmother feeds him rotten food and bad water. However, with the help of the two loons the young man removes the concoction and sees again, realizing it is his grandmother who blinded him and is attempting to starve him. The man returns to the house, kills his grandmother and then lives with the loons (Blue 2007: 3-17).

An intended lesson of the "Blind Boy and the Arctic Loons" is to show respect and reciprocity to other humans, animals and spirits. The grandmother does not want to share the food she prepares with the loons nor the young man, choosing to be greedy. Yup'ik worldview spurns people who are not respectful and those who are greedy. As well as teaching values, the story also supports Yup'ik gender constructs and reinforces codependence of each gender for survival. For example, the blinded young man can no longer hunt for the grandmother; however, rather than picking up the bow-and-arrow herself, the grandmother elects to take the young man to a caribou for him to shoot. She then lies and tells the boy he missed the target and prepares the food without his knowledge (Blue 2007: 7). This story reinforces Yup'ik social constructs of gendered activities and co-dependence.

To examine specific Yup'ik histories, I explored *qullirat* [ancestor's accounts of Yup'ik origin] stories. Examples of *qullirat* [ancestor's accounts of Yup'ik origin] stories include accounts of ancestor's deeds in the Bow-and-Arrow War, as well as, of *Kukugyarpak*, the *nukalpiaq* [great hunter], who traveled from place to place. *Qullirat* [ancestor's accounts of Yup'ik origin] stories supply information about events in precolonial Yup'ik history tied to interpretations drawn in this thesis.

I also analyzed Yup'ik language to ground the project in Indigenous ways of being, knowing and doing. Indigenous scholar, Kristen Barnett states, "language while changing over time, offers us insight into cultural values, beliefs, and ideology. It can tell us what is important" (Barnett 2015: 69). For example, according to the "Yup'ik Eskimo Dictionary" (Jacobson 2012), there are about 65 words that represent *murak* [wood], 45 of which are purely used to describe the preferences for wood production and practices (Fienup-Riordan 2007; Jacobson 2012). To incorporate the Yup'ik language into this research, I critically analyzed the linguistics associated with the construction and use of material remains recovered from the *Temyiq Tuyuryaq* village site, including culturally modified *teggalqut* [stone], culturally modified faunal organics, *murak* [wood] and pottery.

Lastly, this thesis includes an analysis of Yup'ik artwork. As described by Yup'ik scholar, Dr. Theresa John (2010), there are many forms of art including Yup'ik circle-and-dot motif called *ellam iinga,* the conceptual symbols of *Ellarpak* [awareness; the universe], as well as, familial symbology. *Ellam iinga* [circle-and-dot motifs] designs are found on pieces of ritualistic significance like *cauyaq* [drums]. Whereas, familial designs are found on owned items like *qayaq* [kayaks] or pottery (Fienup-Riordan 2007; Yanez personal comm. May 2017).

2.3 Household Analysis

While still encompassed by indigenous archaeology, this project also draws on household analysis to explore systems of activities and settings within the built environment at the Temyiq Tuyuryaq village site. Household archaeology emerged in the late 1960's as a mechanism for understanding settlement patterns (S'obel 2006; Pluchahn 2010; Steadmen 1969; 2016). Amos Rapoport was the major pioneer of this research in the book House Form and Culture (Rapoport 1969; Steadmen 2016). Rapoport developed the definition of the 'built environment, and considered it a social construct that shapes the behavior of the people living within it. Researchers have variously interpreted households as units of a domestic strategy created to meet the productive, distributive, and reproductive needs of the group (Wilk and Rathje 1982), as symbols used to relay information to the occupants about their relationship to the group (Bourdieu 1973; Hodder 1990), as a system of settings that reminds occupants of appropriate behaviors and actions in that setting (Rapoport 1990), and as the base unit of socioeconomic organization, wealth distribution, and social inequality (Kent 1990; Steadman 1996).

Household archaeology defines house's base unit and interprets the houses function through features, semi-fixed features, and artifacts in archaeological contexts and chronologically traces the development of the built environment over time to understand linkages of behaviors, desires, attitudes, and values (Rapoport 1990). Households relay information about the relationships, economy, politics, and religion of the community. In turn, the built environment's symbols are reflections of the social norms required in each household, thus reflecting socially defined culture roles passed down through multiple generations, creating continuity (Ames 2006; Rapoport 1990; Springer and Lepofsky 2011; Steadman 2006).

In the 1970s, archaeologists such as Kent Flannery linked marriage and kinship patterns to the built environment and studied how houses were built, the materiality of the houses, rooms, activity areas, and where houses were located on a landscape in order to understand the socioeconomics of the past community (Steadman 2016). Household theory continued to develop into the 1980s and archaeologists viewed households as the basic building blocks of larger social formations and as points of articulation between societies (Pluckahn 2010). During the processual paradigm shift, materialistic models of household archaeology considered the function and socioeconomic structure of past communities and numerous models of households were proposed in the following decades (Steadman 2016).

Structuralist models emphasized Wilk and Rathje's (1982) transmission and reproduction aspects of household theory. Wilk and Rathje (1982: 620) termed the household as "the level at which social groups articulated directly with economic and ecological processes." Structuralist theory stressed the material and cultural aspects of transmission and the cultural and biological aspects of reproduction. In order to understand the function of a household, archaeologists studied the optimal production units across houses, the distribution of resources within and between households, the transmission of household property and land-use rights, and the socialization of children within the community (Wilk and Rathje 1982). Archaeologists analyzed household sleeping areas, hearths, storage facilities, and shared activity locations to explore whether that community was using collectivist or communal strategies. Collectivist strategies were collaborations between families and individuals to transmit and reproduce, while communal strategies were collaborations between people in the community to transmit and reproduce (Nash 2009, Steadman 2016; Williams *et al.* 2017).

During the post-processual movement of the 1970s-1990s, Amos Rapoport, Ian Hodder and Pierre Bourdieu founded studies based on household signs and symbols (Kent 1990; Rapoport 1990; Steadman 1996, 2016). According to Rapoport, the house reflected the cultural situation, rules, and ongoing appropriate behavior through signs and symbols. In this theory, the household symbolized meaning through the activities people conducted there. By studying the materiality of the household setting, archaeologists could understand the activities and meaning of the activities conducted there (Rapoport 1990). In 1990, Ian Hodder stated archaeologists could read evidence of the relationships people had to each other based on symbols and how the symbols in the house were related across space and time (Steadman 1996). Pierre Bourdieu used household symbolic schema to understand organization of activities and human relationships (Steadman 2016).

In late 1980s and early 1990s, the house was increasingly recognized not just as a space for economic behavior, but also as a symbolic mechanism that contained cultural ideologies. Hendon's (1996) household and domestic group refers to task-orientated, co-residential, and symbolically meaningful social group. The intimacy between people and materiality created a symbolic meaning for the house spaces; thus, the household spaces were places for lived experiences where there were dynamic relationships between people and materials (Fredriksen 2007; Hendon 1996; Steadman 2016).

To interpret the materials from the *Temyiq Tuyuryaq* village, this thesis follows Rapoport's (1990) system of activities and systems of settings. According to this theory, the house reflects the situation, rules, and ongoing appropriate behavior through the signs and symbols of the built environment. The setting links people's activities. Therefore, through studying the artifacts, features, and architecture of the setting at the *Temyiq Tuyuryaq* village, we can understand the sociocultural activities of the people who shared the space. Rapoport's (1990) system of activities and settings are easily situated in the larger theoretical framework of Indigenous archaeological theory. The necessity of traditional and ethnographic data to create a model of activities and settings provides an interpretation founded in Indigenous ways of knowing.

Two basic assumptions of Rapoport (1990) model of household archaeology are that 1) there is a relationship between culture and built form and that 2) architecture encloses and regulates behavior. Assuming there are behavioral relationships between the built environment

and culture, we can ask who does what, where, when, with whom, and why. With these basic assumptions, archaeologists can explore the relationship between activities and architecture guided by sociocultural behavior. Activities are considered the "direct expressions of lifestyle and ultimately of culture…one cannot look at single activity—one must consider activity systems…activity systems are inevitably organized in space and time" (Rapoport 1990:11-12). Activity systems ask: what is the activity, how is it carried out, how is it associated with other activities, and what is the meaning of the activity? Analysis of artifacts, architecture, fixed and semi-fixed features are methods of exploring activity systems. Archaeologists can then link the data to ethnographic literature or traditional knowledge to explore these activities.

Activity systems also do not assume that all sociocultural relationships are bound by the built environment because activities extend to the cultural environment in which people live. "Any given building exists in a wider context to which it is linked through the activity systems of its occupants…activity systems take place in a system of settings" (Rapoport 1990:12). The cultural environment or the system of settings describe the ongoing cultural situations, it reminds occupants of the rules within the environment, and calls for appropriate behaviors in certain situations. Thus, the systems of settings are interpretable to the people living within the culture and it defines certain behavioral patterns (Rapoport 1990). Since systems of activities and settings are highly patterned, archaeologists can examine behavior by analyzing cultural and structural remains. To interpret precolonial behavior, the remains are compared to ethnographic, historical, and traditional records (Rapoport 1990).

Chapter 3

Regional Background

Southwestern Alaska covers a vast expanse of treeless tundra, marsh flats, thick spruce and birch forest, grasslands, lakes, meandering rivers, mountain ranges, and large rocky outcrops. From the flood plains of *Kuigpak* [the Yukon River] along the *Pisalria* [Norton Sound] to the expanse of shrub tundra and marshy lakes in the *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] and rising to the *Ahklun* Mountains near Bristol Bay, the landscape holds a plethora of life. The Yupiit [Yup'ik plural] connect to this landscape through a reciprocal relationship centered on the annual cycle, dictating when subsistence activities, ceremonies and change occur (Fienup-Riordan 2007, 2012; Frink 2016; John 2010; Kawagley 2009).

This chapter reviews the Yup'ik annual cycle throughout southwestern, Alaska and focuses on the traditional cyclical timeframe. The chapter then provides information about Upper Bristol Bay, describing local resources, precolonial Yup'ik history (*Ella Mamkitellrani* [When The Earth Was Thin]) and traditional mechanisms of cultural transmission. Finally, this chapter reviews Upper Bristol Bay's archaeological literature and colonial entanglements.

3.1 The Annual Cycle

In the early spring, village members, wintering in semi-subterranean sod houses, anticipated the break-up of the sea ice and the annual migration of *iqalluarpak* [herring (*Clupea pallasii*)], various salmon species, birds and sea and land mammals. Large aggregated villages were built on raised ocean-side bluffs and the grassy banks of rivers (Fienup-Riordan 2007). These locations offered firm ground rising from the marshy, wetland tundra. Villages were also often situated near important resources— driftwood could be collected, fish caught, sea and land mammals hunted, grasses, mollusks, and fish roe gathered and berries and edible greens picked (Fall *et al.* 2012; Fienup-Riordan 2007, 2012; Jernigan 2012).

Extended families of women lived in the *ena* [family house]. where female Elders, mothers and children worked to prepare for the strenuous harvest and collection months ahead. The Elders taught the young woman the ways of becoming a proper Yup'ik person, while the older girls learned to care for the young and how to make food to deliver to the *qasqi* [men's communal house] for their male relatives (Frink 2016; John 2003; John 2010). The male Elders, fathers, and boys lived in the *qasqi* [men's communal house]. This large structure gave the men

shelter to work on tools and to construct objects such as *qayaq* [kayaks] for the upcoming season. Boys likewise watched their elders and daily conducted strenuous training tasks; such as, shoveling snow, carrying water to houses and checking the weather (Fienup-Riordan 2007, 2012; John 2003; John 2010).

As the sun progressively brightened from the dark winter nights and the tundra warmed, the village would be buzzing with activity, excited and ready for the seasons to come. During the early southwestern Alaska spring, hunting forays watched for sea mammals coming to pup. *Apsiaraq* [bearded seals (*Erignathus barbatus*)] would be surfacing through breathing holes in the ice to give birth, lying in wait for the hunters. The *nukalpiat* [great hunter's] would use a *nanerpak* [spear or harpoon used with an atlatl] to spear seal, the dart point piercing the skin and soft blubber surrounding its body. The whole seals were then taken back to the village and to the family.

Multiple generations of women would carefully cut the seal, saving the precious skin, blubber, intestines, bladder, meat and bones. All the while, young girls intently watched the older more skilled women's movements, learning and honing their skills, which later provided for the community. While processing food for the families, Yup'ik women would think of, "the elder, the disabled, the widowers, and the orphanage members who were unable to provide for themselves" (John 2010: 2). The bladder was then blown-up, dried and saved in the *ena* [family house] until the next winter when during the *Ilgariq* [Bladder Festival] they were released back into the ocean. The seal's soul went into their bladder upon death, and when released back into the ocean, it lived again (Fienup-Riordan 2007: John 2010). If the families treated each other, the environment, the animal and spiritual worlds properly according to Yup'ik customs, the seal would return to that same family (Fienup-Riordan 2007; Frink 2016; Jernigan 2012; John 2003; John 2010).

As the ice began to break and disappear from the ocean, fish camps appeared along the major rivers and tributaries in wait of the greasy salmon swimming upriver to spawn (Fienup-Riordan 2007; Frink 2016; Kawagley 2009). For the fish camps that went upriver, driftwood was collected along the banks or as green wood. *Equgpigaq* [Spruce (*Picea spp.*)] was collected and dried for the construction of wooden tools, the resin was boiled and used like a gum and the needles made into a tea (Jernigan 2012). *Avngulek* [cottonwood (*Populus sect Aigeros*)] was also collected for the construction of smoking houses and drying racks. The young buds of

tayarulunguaq [new edible willow growths] were collected and eaten raw or cooked in soup; willow bark was stripped and used in tea as a pain reliever. *Avngulek* [cottonwood (*Populus sect Aigeros*)] and *cuyanguaq* [willow (*Salix spp.*)] were also preferred for smoking salmon (Alix and Brewster 2004; Jernigan 2012).

Before the hard work of salmon processing commenced, freshwater fish like *ciulek* [pike (*Esox lucius*)], multiple smelt species and *aninirpak* [burbot (*Lota lota*)] were caught and consumed. The fish were typically captured using traps and nets in river tributaries and lakes (Fienup-Riordan 2007). For those who lived along the ocean bays, it was peak spawning season for *iqalluarpak* [herring (*Clupea pallasii*)]. As well as eating the meat, women collected *melucuaq* [herring roe] on the sea kelp (Fall *et al.* 2012; Jernigan 2012)

Spring brought the commencement of migratory fowl, moving to southwest Alaska to feed and lay eggs. The fowl often filled the gap "between scarcity and abundance every spring as the people awaited fish and sea mammal hunting" (Fienup-Riordan 2007: 197). According to the U.S. Fish and Wildlife Services, "more than a million ducks and half a million geese bread in [Southwestern Alaska] annually" (Fienup-Riordan 2007: 197). Birds were hunted using a variety of methods including using *egqaqun* [bird nets], *qelcaq* [snares] *qipiamcetaaq* [bolas], *akitnaq* [bird darts], *akulmiqurataak* [two-pointed arrows] and *asaaqin* [three-pronged spears] (Fienup-Riordan 2007). Often a job for the children—boys and girls would use *akitnaq* [bird darts], *akulmiqurataak* [two-pointed arrows] and *asaaqin* [three-pronged spears] to shoot birds. Women and children gathered eggs from the marshy tundra and rocky outcrops along the ocean and islands (Blue 2007; Fall *et al.* 2012; Fienup-Riordan 2007).

Women and girls travelled on gathering forays for *tumaglit* [low bush cranberry/red berry (*Vaccinium vitis idaea*)] left over from the fall before, frozen under the snow and ice. The berry, combined with seal oil, moose fat or *ceturrnaq* [tomcod (*Microgadus tomcod*)] liver oil, was saved for *akutaq*. *Tumaglit* [low bush cranberry/red berry (*Vaccinium vitis idaea)*] was also made into a juice to be consumed for its medicinal properties, promoting the health of the liver, kidneys, bladder, blood and eyes. It was a common remedy for snow blindness and bladder infections. The stems and leaves were then collected to make into teas for colds and flus (Jernigan 2012). Other berries collected which were frozen over the winter included *tan'gerpiit* [crowberry/blackberry (*Empetrum nigrum*)] and *currat* [blueberry (*Vaccinium uliginosum*)] (Jernigan 2012).

Nutaraq Tuyuryaq [New Togiak] Elder, Annie Blue, described in the *Ageskurpak* [Morning Star] story, how girls often conducted forays into the tundra to pick greens, berries and plants and would invite one another to go along. Elders taught the young girls at an early age to properly gather foods from the land, and they were given the freedom to go picking by themselves (Blue 2007). Elders who were interviewed in the Yup'ik Ethnobotany Project stated, "don't think too much about bears and other dangerous animals (or mention them aloud). It might make them come" (Jernigan 2012: 7). As long as girls followed the proper way of being in the environment, they would be safe (Blue 2007; Jerigan *et al*. 2012).

During the late spring and summer, salmon began to swim from ocean to river— first the *kiagtaq* [king (*Oncorhychus tshawytscha*)], then *caayuryaq* [coho (*Oncorhychus kisutch*], *alluyak* [chum (*Oncorhychus keta*)], *cayak* [sockeye (*Oncorhychus nerka*)], and lastly *amaqaayak* [pink (*Oncorhychus gorbushca*)]. Salmon were cooked, boiled, wind dried, smoked or fermented. Women cut the *kiaqtag* [king salmon (*Oncorhychus tshawytscha*)] into strips, the tail and head saved, while the meat was dried or smoked. The skins and scales were kept to construct clothing, while heads and tails were saved for boiling or drying. *Caayuryaq* [coho (Oncorhynchus *kisutch*], *alluyak* [chum (Oncorhynchus *keta*)], *cayak* [sockeye (Oncorhynchus *nerka*)], and l*amaqaayak* [pink (Oncorhynchus *gorbushca*)] were all halved, tail still attached and hung to dry in the summer wind or smoked. Often heads were saved for boiling or fermentation. Men and boys typically caught salmon with *nalayarrsunn* [salmon spears] and *tapruar/caqutaugaq* [king/coho salmon nets] as they swam up the rivers (Fienup-Riordan 1982, 2017; Frink 2016).

As men and boys diligently retrieved the salmon from the water, pulling the nets in and out; women and girls were in a procession line near the drying racks and *elagyaaq* [smoking houses], processing hundreds of salmon per day (Frink 2009, 2016). According to a modern observations of a fish camp, "a rectangular pit was located near the river shoreline where men deposited the fish to be put into the cutting queue…The fish was cut to optimize drying, and hung on racks to hang in the wind…in the past women used grass mats to protect the fish from rain and blowflies" (Frink 2016: 40).

According to stories from the Yup'ik Ethnobotany Project (Jernigan 2012), Elders would collect *cetupaguat* [fiddlehead ferns (*Dryopteridaceae* spp.)] around fish camps in late spring before the heads unfurled and then would boil or fry the greens. Greens collected in the early

summer near the oceans included *it'garalget* [beach greens (*Honckeya peploides*)] and *mecuqelluguq* [wild celery (*Angelica lucida*)]. *Atsalugpiaq* [salmon berry (*Rubus chamaemorus*)] was picked in abundance in the mid to late summer. It was stored inside blown seal gut and buried in the permafrost to save for winter (Frink 2016; Jernigan 2012). Along the ocean shores, women would have dug for various clams and waited for the tide to go out to gather mussels and small edible sea creatures (John 2010).

In the summer and early fall, *nukalpiaq* [great hunters] and other hunters including young boys (possibly out for their first hunt) would use *qayaaq* [kayaks] to navigate the oceans and bays; hunting *nayiq* [ringed seal (*Pusa hispida*)], *issuriq* [spotted seal (*Phoca largha*)], *qasrulek* [ribbon seal (*Histriophoca fasciata*)], *asveq* [walrus (*Odobenus rosmarus*)] and *apakcuk* [stellar sea lion (*Emetopias jubatus*)]. Seals species were hunted using *aklegaq* [seal harpoons] from the *qayaq* [kayak]. The end of the *cavek* [harpoon] was adorned with *qerruinaq* [harpoon floats], which would stop the seal from sinking. A *negcik* [gaff] was then used to pull the seal back to the *qayaq* [kayak] and it was loaded onto the back. *Asveq* [walrus (*Odobenus rosmarus*)] and *apakcuk* [stellar sea lions (*Emetopias jubatus*)] were hunted from haul-out points along the bays and islands (Fienup-Riordan 2007).

Young boys learning to hunt would go with the older more experienced men to watch until able to make their first kill. After a first hunt, the family dispersed the animal to extended family, Elders and community members. Dispersal of the animal was a rite of passage in which the boy and his immediate family shared the whole animal with the community and didn't keep any for themselves (Fienup-Riordan 2007). Young girls collecting their first berries or greens treated the collection in a similar manner; dispersing it to the community in celebration (John 2010). To accept the new hunters and collectors as a part of the Yup'ik community, their accomplishments were celebrated during the *Kevgiryaraq* [Messenger Festival] (Fienup-Riordan 2007; John 2003; John 2010).

When the sun started to descend more rapidly in the day and the first artic freeze transpired, people left to fall hunting camps. *Tuntu* [caribou (*Rangifer tarandus*)] were the main land mammal target for the Yup'ik, although *tuntuvak* [moose (*Alces alces*)] were occasionally killed (Fall *et al.* 2012). *Tuntu* [caribou (*Rangifer tarandus*)] migrated twice yearly, once in the spring while the females gave birth to their young, and once in the fall to the wintering grounds. Hunters often ambushed *tuntu* [caribou (*Rangifer tarandus*)] along their fall migratory routes by

building *petmiit* [pit traps] or by shooting with *cagnilriit* [sinew backed bows] (Fall *et al.* 2012; Fienup-Riordan 2007). In the late fall caribou antlers were collected in abundance to construct many tools including *keligaun* [scrapers], *aavagun* [wedges] *imruyutaq* [net shuttles], *negaqeggutet* [net gauges], *atauciqerrnat* [two-pointed barbed arrows], *asaaquq* [toggling harpoons], *kukgar* [barbed harpoon points], *nuusaarpak* [three-pronged fish spear], and *tugrun* [harpoon foreshafts]; to name a few (Fall *et al.* 2012; Fienup-Riordan 2007).

Fall and winter fishing occurred along the coast for *iqallugpik* [dolly varden (*Salvelinus malma*)], *paassataq* [arctic char (*Salvelinus alpinus*)], *ceturrnaq* [tomcod (*Microgadus tomcod*)], *cemerliq* [smelt (*Osmeridae spp.*)], and *cagiq* [flounder (*Pluerorectidae spp.*)]. Small mammals were also hunted including *avcellngaq* [voles (*Cricetidea spp.*)], *negluneq/ciriiq* [hare (*Lepus americus*)], *avelqurpaq* [lemmings (*Cricetidea spp.*)], *iliguak* [muskrat (*Ondatra zibethicus*)], *agluruyak* [weasels (*Mustela spp.*)], *angyayagaq* [shrews (*Soricidea spp.*)], *imarmiutaq* [mink (*Neovison spp.*)], and *cikik* [arctic ground squirrel (*Vrocitellus parryii*)]. Small mammals were hunted with *qipiamcetaaq* [bolas] and *agqetaaq* [slings], but most often were trapped and netted (Fienup-Riordan 2007, US Fish and Wildlife Refuge 2018).

Women collected tall grasses for home maintenance, clothing, cordage, cooking and storage. Gasses gathered included *iitat* [tall cotton grass (*Eriophorum angustifolium*)], *qayikvayiit* [wideleaf polargrass (*Arctagrostis latifolia*)] and *taperrnat* [coarse seashore grass (*Elymus arenarius*)]. Women and girls collected the grass during the fall right before the first freeze or after (Jernigan 2012). Grass was a particularly important insulator for homes and clothing. Woven mats covered the walls of the sod houses and insulated shoes, mittens and parkas. Women used the cordage to hang *iqalluarpak* [herring (*Clupea pallasii*)] for drying and used baskets for storing food in the permafrost (Fienup-Riordan 2007; Jernigan 2012; Kawagley 2009).

Ikiituk [wild celery (*Angelica lucida*)] was picked along with the grass, in preparation for the *Ilgariq* [Bladder Festival] where it was traditionally consumed (Jernigan 2012). Mouse foods were collected; including, *utrgungssarat* [teardrop shaped mouse food (*Carex spp.*)], *qitmiruat* [cotton grass tubers (*Eriophorum angustifolium*)], *enegassget* [edged silverweed (*Potetilla edgedei*)] and other seeds and nuts. The mice were always left food to survive the winter (Jernigan 2012).

As the fall rolled into winter and ice formed on the rivers, lakes and ocean, men and boys (old enough to start their training), settled into the *qasqi* [men's communal house]. While extended families of woman, girls, and young children made their home in the *ena* [family house]. This was the time for making things and training the young children. Girls would play at *yaaruiq* [story knifing] in the snow—with long ivory or wooden knives they would cut through the white fluff and tell one another stories. They would learn how to sew clothing for little wooden *inuguat* [family dolls] out of *avelqurpaq* [lemmings (*Cricetidea spp.*)] and *cikik* [arctic ground squirrel (*Vrocitellus parryii*)] fur. The boys were training in the *qasqi* [men's communal house], learning to read the weather and working to haul water and snow. Older men helped the boys build their own *cagnilriit* [sinew backed bows], *qayaaq* [kayaks] and miniature hunting equipment to play with (Fienup-Riordan 2007; John 2003; John 2010). Theresa John, Yup'ik scholar and professor wrote that, "boys sometimes played with girls during *inuguaq* sessions, playing family male roles. Through these specialized games the children began to understand and learn the aspects of family interrelations by imitating real life situations with their toys" (John 2010: 3).

In the winter, families on *ikamraq* [dog sled] teams collected *tep'at* [driftwood]. Wood was used for building essential equipment like *qayaaq* [kayaks] and *kaussuun* (uluaq knife handles), in addition to, fire bathing sessions to cleanse the body through steam and sweat. Fish were collected from fish traps or pulled with line through holes in the ice (Alix and Brewster 2004; Fienup-Riordan 2007). When the sun began to make its assent higher into the sky the cycle begin anew.

3.2 Bristol Bay Region

The study region is located in Upper Bristol Bay (see Figure 3.1). According to the Bristol Bay Native Corporation's Place Names Project, some Elders refer to the area as *Iilgayaq,* but others think *Iilgayaq* is the name for the bay around Nushagak. Therefore, I used the English term, Bristol Bay, for this project to avoid confusion. Bristol Bay is best known for its runs of various fish species, attracting thousands of subsistence, commercial, and sports fisherman every year.

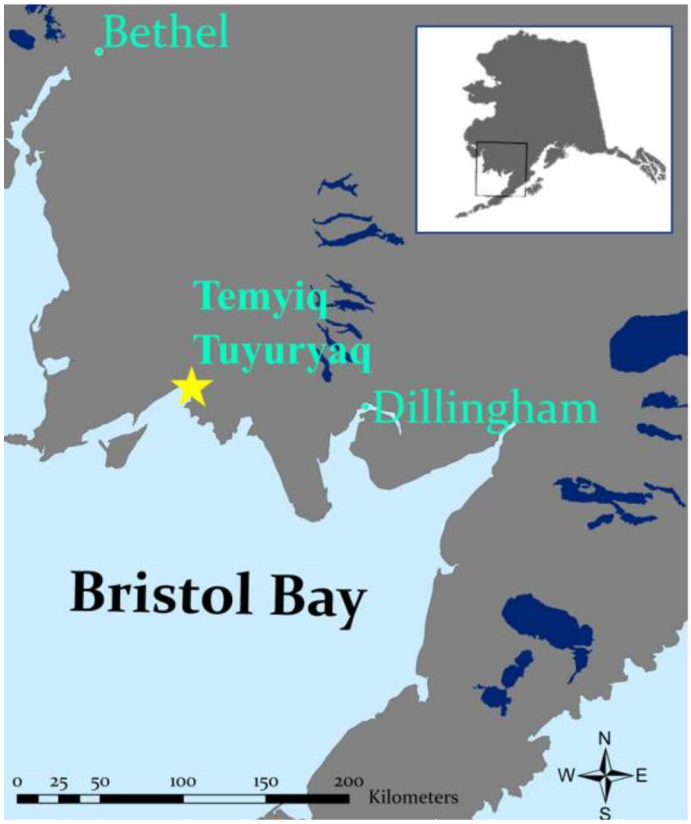

Figure 3.1 Bristol Bay Region. Upper Bristol Bay map including major regional villages and the *Temyiq Tuyuryaq* village.

The region includes the Togiak Bay to the *Nuvupigaq* [Alaska Peninsula and the Aleutian Islands] and is extremely versatile with regard to its landscape, ecology and people. Villages along Upper Bristol Bay have access to a diversity of resources (Fall *et al.* 2012; Fienup-Riordan 2007, 2012; Jernigan 2012). The Bristol Bay area and Walrus Island groups are constructed of rocky headlands on exposed coasts at lower elevations, whereas the *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] consists of lowland tundra formed on Pleistocene silts transported from Interior Alaska (Shaw 1998). The Upper Bristol Bay region is only about 40km from green *murak* [wood] and various mountain plant sources, which are unavailable in the tundra wetlands of the *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] (Alix and Brewster 2004). The coastal current from southeastern Alaska and British Columbia also brings *tep'at* [driftwood] like cedar [*Cedrus spp.]* and hemlock [*Tsugua heterophylla*] through the Unimak Pass (Alix and Brewster 2004; Schaaf 2017). The volcanic activity spreading from the Ahklun Mountains to *Nuvupigaq* [Alaska Peninsula and the Aleutian Islands] resulted in igneous

materials like basalt, rhyolite and pumice being readily available. Similarly, along the *Mamterat* [*Mamterat [Goodnews Bay]*] and *Ugaassat* [Alaska Peninsula] ancient deposits of shale metamorphized into slate, the most common source material for ground stone tools (Dumond 2016; Fienup-Riordan *et al.* 2015; Lyle and Morehouse 1977).

Bristol Bay is known for its extensive salmon fisheries; *kiagtaq* [king (*Oncorhychus tshawytscha*)], *caayuryaq* [coho (*Oncorhynchus kisutch*], *alluyak* [chum (*Oncorhynchus keta*)], *cayak* [sockeye (*Oncorhynchus nerka*)], and *amaqaayak* [pink (*Oncorhynchus gorbushca*)] spawn and run annually in the region (Togiak Wildlife Refuge). *Iqalluarpak* [herring (*Clupea pallasii*)] also spawn yearly in the bay on sea kelp and both the meat and the *melucuaq* [herring roe] are major subsistence resources for the people living there (Fall *et al.* 2012). Along *Qassayiq* [Round Island], there are haul-outs of *asveq* [walrus (*Odobenus rosmarus*)] and *apakcuk* [stellar sea lions (*Emetopias jubatus*)]. *Nayiq* [ringed seal (*Phoca hispida*)], *issuriq* [spotted seal (*Phoca largha*)], *qasrulek* [ribbon seal (*Histriophoca fasciata*)] swim in the chilly waters of the bay and pup on the sea ice (Fall *et al.* 2012). Within the sandy shores there are invertebrates including various cockles, clams and mussels (Kowta 1963). Inland, there are migrations of *tuntu* [caribou (*Rangifer tarandus*)] on the *Ugaassat* [Alaska Peninsula] and near the Ahklun mountain range. Small fur bearing mammals include *negluneq/ciriiq* [hare (*Lepus americus*)], *ceniq'aq* [beaver (*Castor canadensis*)], *aatagaq* [sea otter (*Enhydra lutris*)], aaquyaq [river otters (*Lontra canadensis*)], *avelqurpaq* [lemmings (*Cricetidea spp.*)], *iliguak* [muskrat (*Ondatra zibethicus*)], *agluruyak* [weasels (*Mustela spp.*)], *qaterli* [arctic fox (*Vulpes lagopus*)], and *cikik* [arctic ground squirrel (*Vrocittellus parryii*)] (Fall *et al.* 2012; Fidel *et al.* 2014; Togiak Wildlife Refuge).

From the western edge of Bristol Bay to the village of *Curyuk* [Dillingham], Yup'ik is the prevailing culture. On *Nuvupigaq* [Alaska Peninsula and the Aleutian Islands] people are primarily Unangan and Alutiiq. The proximity of these cultures naturally results in the sharing of ideas and resources, while retaining autonomy in their separate worldviews and languages.

3.3 *Ella Mamkitellrani* (When The Earth Was Thin)

> "The earliest memory of time in Yugtun is referred to as *ella mamkitellrani.* The word *mamkitellrani* (when it was thin) refers

> to a period of time when humans and non-human inhabitants were able to communicate and interact with one another...[and] co-exist with *Ellam Yua*." [The Creator] (John 2010:24).

In Yup'ik epistemology, *Ella Mamkitellrani* is the time before colonists came and forced the surface of the world to become thick. By thickening the surface of the earth, the colonists effectively halted the easy co-existence between humans, non-humans and *Ellam Yua*. However, the traditional education given by Elders to children about *Ella Mamkitellrani* never ceased and these stories describe times of chilly winters with thickening sea ice, warm winters with no sea ice, transformations from humans to animals, marriages between women and driftwood and the naming of the stars (Blue 2007; Fienup-Riordan 2007; John 2003; John 2010). Stories such as these are used to teach the next generation about *Ella Mamkitellrani*, *Ellam Yua* and *Ellarpak*—"the interconnected complex web of the creator, the universe, and the human and non-human world" (John 2010: 13).

There are three types of Yup'ik story's (ref. chapter two) teaching *alerquutet* [the social and cultural values that dictate becoming a proper Yup'ik person]; including, *qanruyutet*, q*ullirat* and q*anemcit*. Specifically, *qullirat* and *qanemciit* stories are ancestor's accounts during *Ella Mamkitellrani* (John 2003; John 2010). Ancestors pass down traditional *qullirat* stories and give instruction on the Yup'ik knowledge system. (Blue 2007; Fienup-Riordan 2007; John 2003; John 2010). These stories include subsistence change, weather change, war and migrations, which also happen to be the foremost interpretations given by archaeologists for culture change and transmission over time (BrennerColtrain *et al.* 2006; Dumond 1984, 2000; Jordan 2009; Knecht and Davis 2008; Maschner 1999; Maschner *et al.* 2009; Maschner and Hoffman 2003; Maschner and Jordan 2008; McGhee 2009; Tremayne and Rasic 2016). *Qullirat* [ancestor's accounts] stories dictate that during these times the ancestors did not belong to a different culture, rather they were living in *Ella Mamkiterllrani*, and their trials and tribulations were to be learned from and passed to the following generations.

Late Elder John Paul relates in a *qanemciq* story, *Tan'gaurluq Kangingaqami taugaam taqtuli* [Boy who had to find out for himself],

> …"at a time when ice no longer melted even during summer.
> It was back when ice would come from this direction

> [motioning with his hands] when the wind blew constantly, even during summer. And during that time the ice was thick, even though the ice continually got water on its edges. Some of it would be twelve feet thick underneath." (John 2003: 309).

This passage speaks with serve weather change seemingly consistent with The Little Ice Age around 500 BP (Jordan 2009).

Other *qanemcit* [ancestor's accounts] tales relate of punctuated warfare between Yup'ik, Yukon and Siberian groups for 1000 years. Warfare ensued from the Siberian Yup'ik, to the Cup'ik of western Alaska, to *Curyuk* [Dillingham] and to the *Nuvupigaq* [Alaska Peninsula]. Battles raged over acts of vengeance and retaliation. Dueling families, villages, kin groups, and cultures commonly enacted warfare (Fienup-Riordan 2016). According to Elder's stories told to Ann Fienup-Riordan (2016), although food stores and materials were potentially raided after a battle, wars were never fought over land. Rather, war displaced communities and they choose to move away from battlegrounds.

Early *qanemcit* [ancestor's accounts] tales link the southern migration of Yup'ik people to warfare and displacement. In Ann Fienup-Riordan and Reardan (2016), Elders relate a general framework of the consequences of these battles, stating,

> …"it is likely that the Algurmiut who resided in Bristol Bay when the Russians arrived in the early 1800s were originally from the Yukon and had either moved south in search of a new location or been pushed south at some point in the Yukon/Coastal Conflict." (Fienup-Riordan and Reardan 2016: 71).

Billy Lincoln of Nelson Island relates,

> …"then when [the people from the Yukon] became apprehensive again [of their enemies' warfare], when they left they stopped over at Annuuraaq over there along the slough

> that is on [the west] side of Kuigilnguq [modern Kwigillingok]. Then again, when they went to them, the [coastal people] also established a village downriver from them once again. When they would become fearful and flee, they kept following them. Finally, from there, they went to the Kuskokwim River and then they also went out to Togiak, and eventually they reached Iilgayaq [Nushagak River]." (Fienup-Riordan and Reardan 2016: 72).

Other wartime *qanemcit* [ancestor's accounts] relate of the Bow-and-Arrow War. The Bow-and-Arrow War possibly spanned a 500-year period and ended before Russian colonialism (Fienup-Riordan and Reardan 2016; Oswalt 1990). The war started and escalated due to vengeance and retaliation, pushing many people from the *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] into the Bristol Bay and *Nuvupigaq* [Alaska Peninsula and the Aleutian Islands] (Fienup-Riordan and Reardan 2016; Fienup-Riordan *et al.* 2015; Frink 2016; Oswalt 1990). Elder George Pleasant of Quinhagak states,

> "There are many people originally from here who moved out [to Kodiak]…In their stories also, our ancestors said that when they were going to kill all the warriors [who had escaped during the battle preceding the destruction of Agaligmiut], [the warriors] tied together logs and drifted away. They beached down on the Aleutians and some of them probably beached at Kodiak Island." (Fienup-Riordan et al. 2015: 48).

Enemies burned the old village of Agaligmuit, ancestral to Quinhagak, in battle between 500 cal BP and 450 cal BP (Fienup-Riordan *et al.* 2015).

Yup'ik travel also occurred for less nefarious reasons. Close kinship ties drew families to one village or another. In *Qulirat Qanemcit-luu Kingguvarcimalriit [Stories for Future Generations]: The Oratory of Yup'ik Eskimo Elder Paul John*, Elder John explains,

> "They say the world is populated by no one else but relatives…Long ago, people did not live like we do now. You know how something connected to the center and therefore together. That was how our Yup'ik ancestors were. Take me for instance. I know my relatives in Chefornak, I know my relatives in Bethel, Kipnuk, Tunuak and Newtok." (John 2003: 19).

According to the *qanruyutet* [advice story], it is important to know one's relatives because when traveling, relatives are the people who provided for you (John 2003).

Late Elder Annie Blue of Togiak also provides evidence for long distance travelling. The *Nukalpiaq* [great hunter], *Kukugyarpak*, travelled from place to place, meeting people and mythical beings along his journey. Throughout the q*anemcit* [ancestor's account] story, *Kukugyarpak* is constantly teaching people or learning. In each location he stops there is a flow of information passing between the village and *Kukugyarpak*. The flow of information between the *nukalpiaq* [great hunter] and other Yup'ik groups is a testament to the knowledge flow between villages (Blue 2007).

Yup'ik traditional stories provide evidence for hypothesized cultural transmission proposed in archaeological literature. Subsistence change occurred because of changing weather and warfare (Fienup-Riordan and Reardan 2016; Fienup-Riordan *et al.* 2015; John 2003). Displacement and war, as well as close kinship ties across southwestern Alaska, caused the Yup'ik to move from place to place, sharing ideas and information with a wide range of people (Blue 2007; Fienup-Riordan and Reardan 2016; John 2003).

3.4 Archaeology of Precolonial Bristol Bay

According to current archaeological literature, people have been continuously occupying the Bristol Bay region since 6000 cal BP (Schaaf 2017). Although there are known occupations on the *Nuvupigaq* [Lower Alaska Peninsula and the Aleutian Islands] at 9,000 cal BP (Davis *et al.* 2016; Schaaf 2017). The 6000 cal BP occupation of *Qayassiq* [Round/Walrus Island] suggests people came to the island to hunt at the walrus haul-out and fish in the active waters. Research at the *Qayassiq* village reveals 105 houses and storage surface depressions, including a large, rectangular house depression with multiple entry rooms. The earliest component of the

site (6000-3690 cal BP) unveils undecorated ceramic fragments, tempered with plant fiber and pebbles, chipped knives, adzes, end and side scrapers, microblades, large lanceolate endblades, a pecked stone lamp, and single polished slate tool (Schaaf 2017). While the microblades, knives and scrapers are associated with mainland occupations during the same era (Arctic Small Tool tradition), the pecked stone lamp, polished slate and lanceolate endblades are related to villages along the Pacific Rim (Schaaf 2017). People living on the *Nuvupigaq* [Lower Alaska Peninsula and the Aleutian Island] carried a similar set of tools including lanceolate endblades, chipped blades and microblades (Maschner 2016). Suggesting that people across the Bristol Bay, Pacific Rim, and interior of Alaska were extensively sharing ideas and technology for at least 6000 years.

Akin to the *Qayassiq* village, circa 5000 cal BP on *Ugaassat* [Alaska Peninsula], archeologists have excavated endblades, chipped blades, microblades, burins and chipped scrapers in the *Nakiq* [Naknek] River Drainage. Similar campsites are located along lakes in the flat lands in the interior of the upper Bristol Bay. Records at *Akustukuk* Lake illustrate a tool kit of microblades, flaked bifaces, burins and scrapers near a shallow, salmon-rich waterway (3900-3600 cal BP), in addition to, a square sod house depression. While west of the Ahklun Mountains, along the Kvichak River, archaeologists found microblades associated with the Arctic Small Tool tradition and a square sod house and central hearth dating to 3580 cal BP. Endblades, microblades, and a slab lined hearth dating to 3400 cal BP were found in association with a sod house in the Wood-River Tikchick System. Microblade cores, microblades, flaked bifaces, burins, chipped scrapers and chipped knives, relatively dating to circa 5000 cal BP were excavated in the Ugashik Narrows (Dumond 1984, 1995, 2005; Tremayne and Rasic 2016).

Although, the locations indicate salmon as a major food component, the cultural materials suggest large game hunting occured. *Tuntu* [caribou (*Rangifer tarandus*)] migrations through the Ahklun Mountains and *Ugaassat* [Alaska Peninsula] would have passed directly by the Kvichak River and *Nakiq* [Naknek] River Drainage (Dumond 2005). While at the *Qayassiq* village, blade technology was used to hunt *asveq* [walrus (*Odobenus rosmarus*)] and multiple seal species (Schaaf 2017). Some archaeologists argue the tool kit was not suitable for sea mammal hunting; however, in coastal villages on *Nuvupigaq* [Alaska Peninsula and the Aleutian Islands] and at *Qayassiq*, *asveq* [walrus (*Odobenus rosmarus*)] and seal species were the only major resource besides salmon and birds. Thus, opposing authors state the large sea

mammals could have effectively been hunted using blade technology from haul-outs or atop the sea ice (Dumond 2005; Maschner 2016; Schaaf 2017; Steffian *et al* 2016; Tremayne and Rasic 2016).

Archaeologists Robert Ackerman and Robert Shaw extensively surveyed the upper Bristol Bay Region for cultural remains in the 1960's and 70's by airplane, ground survey and pit testing (Ackerman 1964, 2008; Shaw 1998). The archeologists noted many coastal and riverside villages and camps with tools indicating occupations linked to interior Alaska's Northern Archaic Tradition. These sites were found in *Mamterat* [*Mamterat [Goodnews Bay]*], Security Cove, and the *arviiq* [Platinum] area. However, the sites were only relatively dated to the Northern Archaic using comparisons between notched and stemmed points in the bays to those from Onion Portage in northern Alaska. Although there are connections between the artifact typologies, only a single radiocarbon date of 4200 BP is known from the Security Cove area (Ackerman 1964, 2004; Gallison 1983; Larson 1950; Schaaf 2017; Shaw 1998).

Villages from 3500-1500 cal BP are primarily located along major rivers, lakes, and raised, ocean-side sand ridges. Tools persisting from the previous generations include a well-established chipped side-blade, scraper, and adze industry. Microblades also continue for 500 years along the *Nakiq* [Naknek] River Drainage. New tools, introduced circa 3000-2500 cal BP, include stemmed points, pottery (check-stamped, and fiber/gravel tempered), stone lamps, *uluaq* [ulus], and polished slate. Archaeologists refer to the introduction of check stamped pottery, stone lamps and ground slate as the Norton Tradition (Bundy 2007; Dumond 1981, 1982, 1984, 2000, 2005; Schaaf 2017). Continuing village occupations include *Qayassiq*, *Nakiq* [Naknek] River Drainage, Ugashik Narrows, and Kvichak River. Other villages with occupations dating to around 3000 cal BP include Summit Island, *Qanruyutet* [on Hagemiester Island], Crooked Island, Chagvan Bay, *Qikertarpak*, *Unalakleet*, a village on the south side of Lake Iliamna and a village on Lake Nonvianuk (Ackerman 1988; Bailey 1991; Bundy 2007; Dumond 1981, 1982, 2000, 2005; Schaaf 2017).

Excavations at *Qayassiq* revealed stemmed blades, chipped end-and side blades, bifaces, burins, ground slate blades, pumice abraders, and basalt/metatuff artifacts dating to approximately 3690-3210 cal BP. *Asveq* [walrus (*Odobenus rosmarus*)] ivory and bones were found in more than one test unit, along with seal vertebra and numerous bird remains. Three distinct house depressions dating to 2365-1530 were mapped with six or more rectangular

houses and no entryways, which were interpreted as a *qasgiq* [men's communal houses] and *ena* [family house]. Exposed above a house floor were large sea mammal ribs, interpreted as structural remains, in lieu of rare *tep'at* [driftwood]. Found beside a variety of faunal remains were mollusk shells. Within the households were pottery sherds, notched pebbles, stone vessels, chipped stone end-and side-blades, drills, knives, a toggling harpoon and ground slate tools. Check-stamped, fiber-tempered pottery was found in both 3690-3210 cal BP and 2365-1530 cal BP components (Schaaf 2017).

At the *Nakiq* [Naknek] River Drainage site bipointed projectiles, end-and side-blades, chipped scrapers, burins and microblades characterize the cultural remains dating between 3800-3000 cal BP. Also found during excavation was one small square house with a side entryway. Persisting from previous occupations were end-and side-blades, chipped scrapers, burins, and knives persist, although stylistically distinct artifacts such as 26 new projectile points, asymmetrical chipped knives, ground slate tools including *uluaq* [ulus], notched pebbles for net sinkers, check-stamped, fiber tempered pottery and *cungapak* [labrets] were found. (Dumond 1981, 1982, 1984, 2000, 2016). Other villages and camps from that era include *Qanruyutet* [Hagemiester Island] and villages near Ugashik Narrows, Kvichak River, Chagvan Bay, Manokinak and Qikertarpak. In the mountains around Bristol Bay, numerous small sites have also been identified and interpreted as short term hunting camps (Ackerman 1964; Baily 1991; Bundy 2007; Dumond 1981, 2000, 2009, 2016). These villages are similar in that the archaeological assemblage reflect expanding toolkits and increasingly large settlement structures.

Some archaeologists argue that the changing tool kit signifies a heavier reliance on fish, leading to increased sedentism and large villages. Although most sites occupied between 6000-3500 cal BP are located in areas where fish is a prevailing resource, it is not until after 3500 cal BP that large, semi-sedentary villages are constructed (Dumond 2016). Dumond (2016) interprets the presence of net sinkers and sites near the mouths of streams as an expanding salmon industry, suggesting a heavier reliance on a dependable resource. Graesch (2007) also proposes that the increasing use of ground slate tools, especially the *uluaq* [ulu], is a response to a heavier reliance on salmon (Bundy 2007; Dumond 2000; Maschner and Hoffman 2003; Maschner and Jordan 2008; Schaaf 2017).

Ground slate stones, pecked stone tools and *cungapak* [labrets] were used in the Pacific Rim, Southeast Alaska and down into the Pacific northwestern United States from 1000 to 4000 cal BP before incorporation into the Bristol Bay region. Pottery, conversely, originated in Asia and western Alaska before it was brought to Bristol Bay; implying a continuation of extended trade and social relations among Asia, western Alaska, southwest Alaska, and the Pacific Rim (Bundy 2007; Dumond 2016).

The incorporation of pottery into the household indicates that people around the Bristol Bay region were becoming increasingly sedentary (Dumond 1982). Harry and Frink (2008) propose that unfired cooking and storage pottery would take skill to construct and require a longevity to dry. Alaska's southwestern rainy and damp landscape hinders the hardening of the pots and drying can take at least a whole summer and up to one year (Harry and Frink 2008; Harry *et al*. 2009). Making and using storage pots also indicates an intensive stockpiling of resources to support an increasingly sedentary life.

Frink (2007, 2009) suggests that, the management of storage techniques may indicate a diversifying social dynamic between men and women, as storage is a primarily female task. According to Yup'ik Elders from the Chevak Region, women are the pottery makers, keepers and users. Pottery, an essential tool for sedentary lifestyle, means an expanding social structure for women (Frink 2007, 2009, 2016).

In support of evolving social dynamics is the incorporation of *cungapak* [labrets], which are a status and age deriving lip ornamentation. Tlingit, Haida and Tsimshian *cungapak* [labrets] are exclusively worn by women, symbolizing both the woman's social status and the life stage she is occupying. In other areas of the northwest coast and in southern and southwestern Alaska, both women and men wore *cungapaak* [labrets]. The *cungapak* [labrets] are a social and age deriving ornamentation, but the location, size and styles often differ between men and women. In the Central Yup'ik language there are terms for male and female *cungapak* [labrets], as well as, round and side *cungapaak* [labrets], including *aqervik* [women's labret], *elciqaruaq* [man's labret], *uivvsak* [round labret] and *caqiqsak* [side labret]. *Cungapak* [labrets] excavated from villages occupied around 3500 cal BP suggest that the display of social status and life stages are long-standing traditions in these communities (Jacobson 2012; Moss 1999).

From 1500-200 cal BP, the Bristol Bay Region was characterized by a growing number of villages, *qasgitt* [men's communal house; plural] and *enaat* [family house; plural] had long semi-subterranean tunnels, extensive reliance on ground slate tools, *kenukcuk* [stone lamps], lamps, expanding *cavek* [harpoon] technology, and globular pottery tempered with sand and gravels. Excavations dating to this era reveal large proportions of organic implements including beaver tooth knives, *cavek* [harpoons], *piicikaq* [birchbark] and *mingqaaq* [tightly coiled grass baskets], *alqin* [grass matting], *tangluq* [snowshoes], *igguak* [snow goggles], *ikamraq* [dog sleds], *cukangegautaq* [sinew-backed bows], barbed darts, and *egun* [throwing boards] (Ackerman 1964; Dumond 1981, 1984, 2003, 2009; Giddings 1957; Kowta 1963; Mason 2016). This assemblage of material culture is widespread in contemporaneous occupations throughout southwestern and western Alaska and across the northern coast of Canada. Archaeologist refer to these expanding maritime villages and technologies as the Thule Tradition (Dumond 1984, 2009, 2016; Fitzhugh 2016; Mason 2016).

Regions with villages persisting from earlier dates in the Bristol Bay Region include the *Nakiq* [Naknek] River Drainage, *Arviiq* [Platunim], Chagvan Bay, Pavik on the *Ugaassat* [Alaska Peninsula], Snag Point, Tikchik lakes, the Ugashik drainage and villages along the Nushagak River. Villages off the coast of Bristol Bay like Qayassiq [Round Island] and *Qikertarpak* [Hagemeister Island] converted to seasonal hunting places rather than semi-sedentary villages as people moved to the mainland shore and river systems. Semi-sedentary communities grew in population all along the coast, and excavated villages include *Temyiq Tuyuryaq*, Amanka Lake Village, the Leader Creek Site, Paugvik, and Quinhagak (Dumond 1995; 2003; 2009; Kowta 1963; Larson 1950; Ledger *et al.* 2016).

Archaeologists characterize the Thule as people whose tools and houses developed in western Alaskan coast circa 1500 cal BP and rapidly spread throughout the coastal arctic, suggesting that the Thule relocated and displaced other people along the coast by either warfare or integration (Dumond 1981, 1995, 2000, 2003, 2005; Fitzhugh 2016; Maschner and Jordan 2008). Maschner and Jordon (2008) suggest that the warlike Thule came to Alaska from eastern Asia, sporting recurved longbows and marching their way across the arctic, invading and integrating into local communities. The people of *Nuvupigaq* [Alaska Peninsula and the Aleutian Islands] defended themselves from the Thule by building large defensible communities and establishing a social hierarchy for protection. Misarti and Maschner (2015) also suggest that

wife acquisition on the *Nuvupigaq* [Alaska Peninsula and the Aleutian Islands] accounted for the diversifying tool kit. The authors interpret the expanding diversity of ground slate tools, especially the *uluaq* [ulu], as expanding wife trade from the Pacific Rim or Upper Bristol Bay (Misarti and Maschner 2015).

Other authors (Darwent and Darwent 2016; Dumond 2009; Jordon 2008; Maschner and Jordon 2008) offer a more simplistic interpretations, inferring that varying climactic conditions account for the cultural changes. Circa 1500 cal BP, the Medieval Climatic Anomaly warmed the ocean's temperature and opened waters for longer portions of the year. The Medieval Climatic Anomaly supported a diversified maritime development and expanded harpoon technology for longer, open-water hunting seasons. The Medieval Climatic Anomaly extended into 500 cal BP, when the Northern Hemisphere cooled significantly during the Little Ice Age (Dumond 2008; Jordon 2008; Maschner and Jordon 2008).

Throughout southwestern Alaska and in the Bristol Bay Region there are clear continuities between 3500-1500 cal BP (Norton Tradition) and 1500-200 cal BP (Thule Tradition), suggesting a continuous occupation of the landscape for 3500 years. When considering the Qassayiq village, some cultural remains are directly related to later periods, such as the use of slate technology, pecked stone lamps and pottery at 6000 cal BP (Schaaf 2017; Steffian *et al.* 2016). This may push the continuous occupation of the Bristol Bay to a much earlier date.

3.5 Colonial Entanglements

Beginning in 1741, *promyshlennki* [Russian fur hunters] travelled to Alaska targeting the Aleutian archipelago for fur seals and *aatagaq* [sea otters (*Enhydra lutris*)]. Russians established the first outpost in 1784 at Three Saints Bay called Shelikhov (Drabek 2012). Alutiiq stories bespeak of occasional trading and battles, which ended in a massacre of Alutiiq people by the Russians at Shelikhov. The Russians subsequently enslaved Alutiiq peoples and forced the men and boys to hunt *aatagaq* [sea otters (*Enhydra lutris*)] year-round, while they held the women and children captive (Afonsky 1977; Drabek 2012). After over-hunting in the Aleutian archipelago, the Russians turned to *ceniq'aq* [beaver (*Castor canadensis*)], *aatagaq* [sea otter (*Enhydra lutris*)], aaquyaq [river otters (*Lontra Canadensis*)] *qaterli* [arctic fox (*Vulpes lagopus*)] and *imarmiutaq* [mink (*Neovison spp.*)], further north where they set up the

Russian-American Company (RAC). The Russians left Bristol Bay Region relatively unexploited until the RAC began (Frink 2016; Kowta 1963).

The Nushagak Peninsula and *Ugaassat* [Alaska Peninsula] became the focus for fur trading in the Bristol Bay (Kowta 1963). The establishment of a small trading station named the Lebedef company was set up on the Nushagak River, but only for a short time (Kowta 1963). Bristol Bay again experienced only occasional trading until 1818 when Fort Alexadrovsk was established at Nushagak by the Shelikhov Company. By 1826, an atlas was published of Alaska which included the Bristol Bay and a mapped portion of *Temyiq Tuyuryaq* (Kowta 1963).

During the 1820s, the breadth of imports into the Bristol Bay increased including alcohol, tobacco, molasses, bread, sugar, glass beads, buttons and coins (Frink 2016). Instead of enslaving the populations of Bristol Bay, Russian traders were encouraged to marry Indigenous women, so the descendants could be future trading partners. The Russian Orthodox Church also built a mission in Nushagak (Kowta 1963).

The interaction with Russian colonialists changed after 1867 when Russia sold Alaska to the United States. The United States set up the American Commercial Company (ACC) for fur trading and numerous small businesses came to Alaska. American entrepreneurs poured into Alaska and deemed it the 'Last Frontier' and they collected resources and displaced people. Along with the colonists came the deadly epidemics and chronic diseases like tuberculosis, smallpox and influenza. The 'Great Sickness' (measles) in 1861, and the outbreak of Spanish influenza in 1918, were catastrophic to native villages (Frink 2016; Kowta 1963).

In 1880, the census bureau appointed Ivan Petroff to undertake a census of Alaska for the United States. Petroff made an extensive survey of the Bristol Bay area and for the first time a colonist noted, in writing, *Temyiq Tuyuryaq* and five other villages along the Togiak River. Petroff also noted a small trading post east of the river, although there was not extensive knowledge of the region by Petroff (Kowta 1963; Petroff 1990). By 1884, the cannery was set up on *Temyiq Tuyuryaq* spit, and although changing hands multiple times, it is still running today (Barnett 2018).

By 1959, the Moravians erected a church in *Nutaraq Tuyuryaq* [New Togiak], the Bureau of Indian Affairs established a school, and the National Guard founded an armory (Kowta 1963). The move from *Temyiq Tuyuryaq* transpired between 1900 and 1950 and three sources characterized the move (Alix and Brewster 2004; Barnett 2018; Kowta 1963). The first

source was a *Tuyuryaq* resident that informed Kowta (1963) that the *Tuyuryaq* community moved because the village was decimated by disease. Two community members also suggested to Barnett (2018) and to Alix and Brewster (2004), that the driftwood was more plentiful on the *Nutaraq Tuyuryaq* [New Togiak] side, so they moved.

The effects of colonialism and generational trauma on Indigenous communities were lasting; however, continuity and resilience against colonial forces held Indigenous Yup'ik values, epistemology and ideology intact. *Qanruyutet*, *qullirat* and *qanemcit* oral stories used for teaching carry on throughout the generations, some passed down in books edited by anthropologists or ethnographers (Blue 2007; Fienup-Riordan 2007; John 2003; John 2010; Kawagley 2009). The annual cycle never ceased, and although displaced by colonialism, the locations, the activities and the ideology behind the subsistence lifestyle continue (Fienup-Riordan 2007; Frink 2016; John 2010; Kawagley 2009). Community leaders and Elders continue speak *Yugtun* [the Yup'ik Language], and there are local school programs, university programs and traveling teachers dispensing education to the younger generations (Charles personal comm. Sept 2018). Although colonialism forced a foreign lifestyle onto the communities, they continue to remain uniquely Yup'ik.

Chapter 4

The *Temyiq Tuyuryaq* Village

This chapter situates the reader in the *Temyiq Tuyuryaq* village, and provides a description of the village, local resources, weather and occupational timeline. The chapter then explores the 1960 archaeological excavation of the village, the University of Montana research conducted in 2015 and the current collaborative research between Togiak Traditional Council and Bates College (Barnett 2018; Kowta 1963; Prentiss and Barnett 2017).

4.1 *Temyiq Tuyuryaq*

The *Temyiq Tuyuryaq* village is situated on an accreting sand spit on the eastern shore of the Togiak Bay. The village is built much like a Near Eastern 'tell,' created from generations of house construction, use, abandonment and new construction (Barnett 2018). According to the 2015 mapping, there are 69 traditional semi-subterranean *ena* [family houses] and *qasagi* [men's communal house] with occupations spanning back to 1300 years (Prentiss and Barnett 2017). In 2017 the site was mapped by Bates College (Maine) and *Tuyuryaq* [Togiak] High School students, which identified more than 115 surface features including houses, external cooking pits and storage features (Barnett 2018).

Village location is advantageous for hunting sea mammals, small land mammals, fish and birds. Seals bob in and out of the waters around the spit and *asveq* [walrus (*Odobenus rosmarus*)] sunbath on *Qayassiq* [Round Island], approximately 55 km away (Schraaf 2017). Yup'ik people conduct fishing in all seasons from the shores of the bay and up the Togiak River only a few kilometers from the village. Residents pick *melucuaq* [herring roe] from sea kelp during low tide. Eggs are gathered from spring nests in the salt marsh right beside the village (Fall *et al.* 2012). Various mollusks are available in the beach and during low tide (Kowta 1963). Small-and medium-sized mammals also make their homes at or near the village.

During the spring and fall, *tumaglit* [low bush cranberry/red berry (*Vaccinium vitis idaea*)] is available on the high tundra located approximately one kilometer down the beach, while *atsaluqpiaq* [cloud/salmon berry (*Rubus chamaemorus*)] is found further inland. Tall grasses are gathered in the summer and fall from the sea shore. *Ikiituk* [wild celery (*Angelica lucida*)] is picked with the grasses, while beach greens are found on the sandy ocean beaches

(Jernigan 2012). *Murak* [wood] is available along the shores of the bay and can also be cut green 40 km up the Togiak River (Claire *et al.* 2004; Claire and Brewster 2004).

The radiocarbon sequence of *Temyiq Tuyuryaq* suggests an occupation from at least 1300 cal BP until village relocation to *Nutaraq Tuyuryaq* [New Togiak] in the early-to mid-1900's (Barnett 2018; Prentiss and Barnett 2017). The occupation of *Temyiq Tuyuryaq* coincides with village occupations at the *Nakiq* [Naknek] River Drainage, *Arviiq* [Platunim], Chagvan Bay, Pavik on the *Ugaassat* [Alaska Peninsula], Snag Point, Tikchik Lakes, the Ugashik drainage, villages along the Nushagak River and at Quinhagak just west of Bristol Bay (Dumond 1995; 2003; 2009; Kowta 1963; Larson 1950; Ledger *et al.* 2016). Occupations at these locations occur during the Thule Tradition's far-reaching influence on the Alaska coastline. Archaeologists suggest that the Thule invaded or integrated with local populations along southwest Alaska circa 1400 BP (Dumond 2009; Jordan 2009; Maschner and Jordan 2008; Mason 2016).

Dumond (1984, 2009) and Schaaf (2017) suggest *Temyiq Tuyuryaq* represents a village settled by the Thule who were ancestral to Yup'ik. However, many of the cultural remains recovered from the site during Kowta's (1963) excavation are similar to artifacts from earlier occupations in Bristol Bay. Dumond (2016) proposes that there is robust continuity between the Norton and the Thule in the *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] and *Ugaassat* [Alaska Peninsula]. When considering the *Qassayiq* village, continuity of some artifact types may extend to 6000 cal BP in the Bristol Bay region.

Figure 4.1 Temyiq Tuyuryaq View to the East. Photo encompasses the tall grasses in the village and housepits. Photo taken by author.

Figure 4.2 Bates Students in a Housepit. Three Bates College Students stand with coring machine in large housepit. Photo taken by author.

4.2 1960 Excavation

Graduate student, Makoto Kowta, and Dr. Wendel H. Oswalt from the University of California Los Angeles (UCLA) flew into *Temyiq Tuyuryaq* in early June 1960 (Kowta 1963). With the help of Dr. Oswalt, Kowta opened a 66-foot by 30-foot excavation on the southeastern portion of the mound. Each square unit was 6 feet by 6 feet and totaled 55 units. There were 16 surface features "rang[ing] for the most part from two feet to four feet in diameter, but one was considerably larger. The smaller ones were undoubtedly storage pits, the larger one possibly the remains of a house" (Kowta 1963: 50).

After the archaeologists removed all the sod from the units, Kowta was left by himself to finish excavating during the months of June, July and August. Deciding not to excavate the house structure at the northern end, he pursued units 21-55 instead.

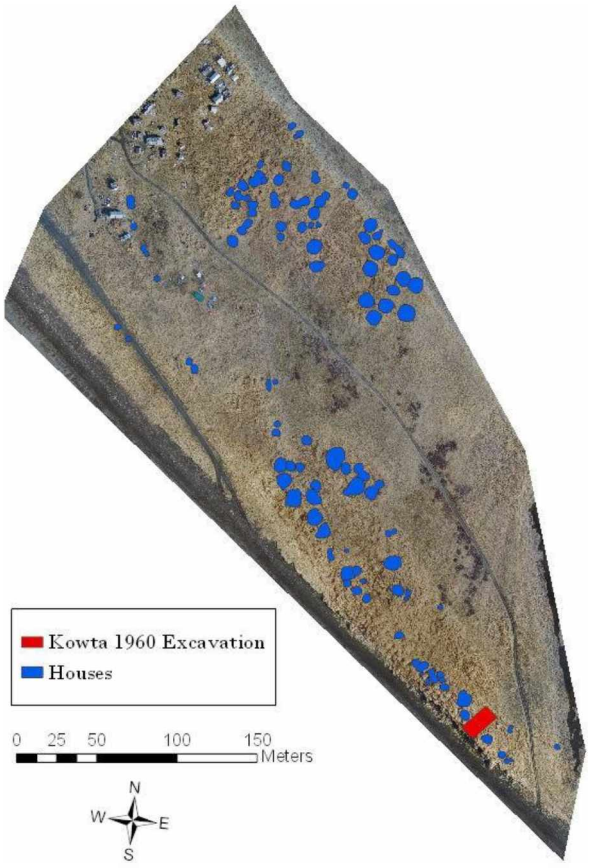

Figure 4.3 *Temyiq Tuyuryaq* Village. The image was taken from a drone above *Temyiq Tuyuryaq*. The blue circles indicate housepits and the red rectangle indicates the old excavation. Map courtesy of Dr. Kristen Barnett.

With the methods of the day (a shovel, trowel, no screen and a selective approach to artifact collection) Kowta gathered cultural remains that looked significant; such as, hunting and traveling equipment, tools, ornamentation, storage items, cooking items, and toys (Kowta 1963).

The excavation was shortened after the first 12-inch level and units 36-55 were perused (Kowta 1963). After six levels (72 inches), the excavation was narrowed to only four units, which flanked the western border of the cut (units 36, 41, 46 and 55) (Kowta 1963). In five more levels (132 inches total), after completion of the cultural horizon, one more foot was dug for a vertical sampling of 12 feet (Kowta 1963).

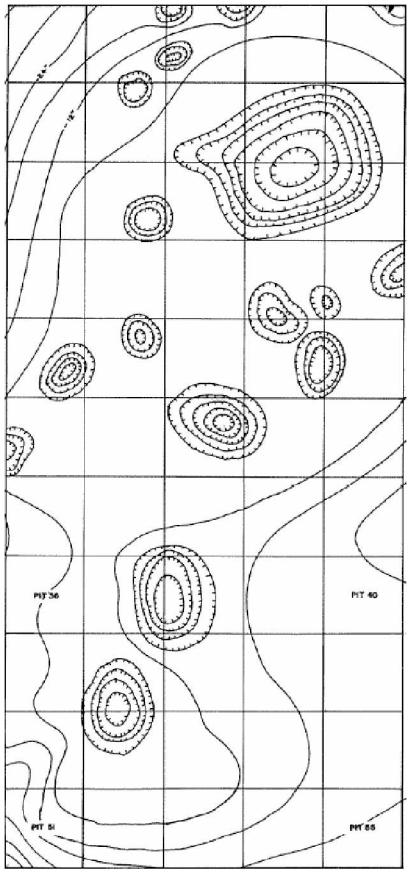

Figure 4.4 Excavation Surface Features and Units. Map illustrates the units and surface features excavated by Kowta. Kowta 1963 Figure 2 TA-IA Surface Features.

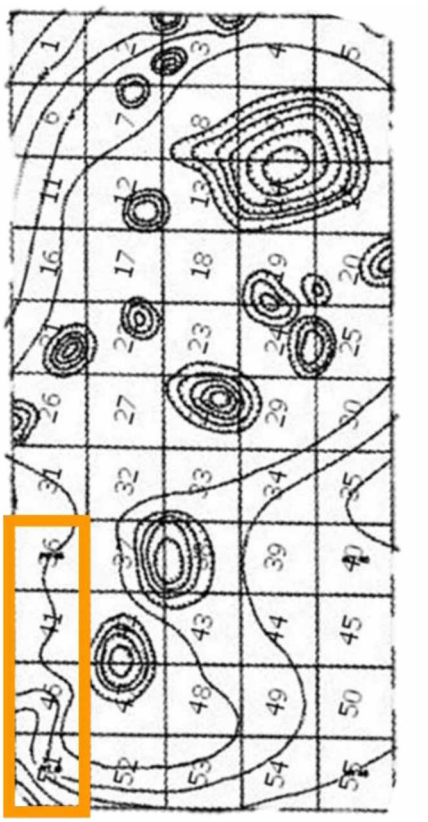

Figure 4.5 Surface Features and Box with Final Four Units Excavated. The excavation with surface features and units. The orange box indicates the four units that were completely excavated. Kowta 1963 Figure 2 TA-IA Surface Features.

Excluding the sod level, there was approximately 200 square yards excavated during the three-month period. From artifact counts located in the field catalog, 3,084 culturally modified artifacts and 1,101 faunal remains were collected. Kowta also made a small cut further to the southeast of the mound (TG-1B); however, this cut was not pursued after the first level. From TG-1B, there was 34 artifacts; for a total of 4,219 cultural remains (Kowta 1960, 1963).

The main research proponent of Kowta's dissertation project (1963) was to 'amplify' the scanty ethnographic data of the region. Using the methodologies of the time, the materials were characterized and sorted. Kowta (1963) interpreted the excavated portion of the mound to be a large midden. He also concluded that the cultural remains reflected a major shift from year-round occupation to a primarily winter occupation circa 400 BP, leading to the village's eventual abandonment before colonial influence. He also concluded there was deteriorating seal hunting conditions in the bay eventually forcing the people to move inland (Kowta 1963).

4.3 2015 Exploratory Research

In 2015 researchers from the University of Montana conducted a single field season at *Temyiq Tuyuryaq*. The researchers extensively mapped the surface of the village, marking the location of houses, pit features and the boundaries. Additionally, the researchers mapped and drew profiles of mound faces affected by erosion. A geomagnetic survey of the village attempted to locate zones containing high frequencies of magnetic anomalies, pinpointing activity throughout the mound. Utilizing the maps and geomagnetic survey, 36 core samples were collected from household contexts and returned to the University of Montana for radiocarbon dating and charcoal, faunal and botanical analysis (Barnett personal comm. September 2015; Prentiss and Barnett 2017).

Based on the analysis of village stratigraphy, Kowta's 1963 maps, and erosional profiles, the University of Montana researchers, Prentiss and Barnett (2017), concluded that the mound was similar to a house-mound structure with some midden fill, consistent to mounds found in the Bering Strait and northern Alaska. Radiocarbon dating concluded that occupation of the village spanned at least 1300-200 cal BP, although the site may also have older components (Prentiss and Barnett 2017). Botanical and faunal analysis also revealed that the site was occupied year-round, contrary to Kowta's (1963) interpretation of a winter settlement, and that plants and animals were broughout to the site for consumption and winter storage.

4.4 2017 and 2018 Collaborative Project

In 2017 the Togiak Traditional Council and Dr. Kristen Barnett of Bates College, (Maine) constructed a collaborative archaeological field experience, including students from Bates College in Maine and High School Students from Togiak, Alaska. The project is a part of a long-term collaboration between the Togiak Traditional Council and Dr. Barnett and centered on a localized Indigenous interpretation of the *Temyiq Tuyuryaq* village. In 2017, 28 Togiak and Bates College students, Dr. Barnett and I spent one week within the Togiak High School conducting a Yupiit-first approach in archaeology. The week included teaching students about the theoretical and methodological foundations of archaeology, inspecting and discussing material remains from *Temyiq Tuyuyraq* and creating a space for Elders to communicate and teach the students and researchers. During many of the school days community members came into the class and discussed techniques for subsistence, to deliberate on the material remains

located at the Togiak Cultural Center, and to impart oral traditions. During the final day of instruction, a group of Elders and community members sat with the youth and researchers, discussing life at *Temyiq Tuyuryaq*.

Following the week of work at the school, Dr. Barnett, Bates students, three students from the Togiak High school and I boated from *Nutaraq Tuyuryaq* to *Temyiq Tuyuryaq*. We spent the subsequent week mapping, taking core samples and discussing subsistence and botanical resources. Thanks to a local student with extensive historical knowledge, the map was extended to include the historical cabin occupations, which in 2105 were claimed by the cannery (Barnett 2018).

Chapter 5
Research Methods

This chapter is split into three sections. The first section provides the methods for the analysis of the culturally modified materials from Temyiq Tuyuryaq and for the radiocarbon dating of organic remains from the village. The second section provides the methods used in household analysis and a model of a Yup'ik household. The third section provides the methods used to analyze change and continuity in the Temyiq Tuyuryaq artifact assemblage during the Little Ice Age.

5.1 The Culturally Modified Materials

The research methods are designed to meet the objectives of this project (see Chapter One). Objective one encompasses three goals; (1) redefine the material remains excavated at *Temyiq Tuyuryaq* by Kowta (1963) following a Yup'ik-based interpretation, (2) analyze the production, functionality and discard of the cultural materials and (3) to explore patterns of continuity and change in the material remains over time. For this analysis, I formed categories using Indigenous archaeological methodologies and standard archaeological analysis. I also sent samples to DirectAMS for radiocarbon (C^{14}) analysis to explore the continuity of occupations at *Temyiq Tuyuryaq*.

In total, Kowta collected 2,915 culturally modified *teggalquq* [stones], culturally modified faunal organics and culturally modified *murak* [wood] during the 1960 excavation (1960). Additionally, he collected 57,864 grams of pottery (without keeping an exact count) (Kowta 1960). Kowta (1963) also collected, but did not retain 1105 unworked faunal elements, which I did not consider in this analysis. In lieu of reanalyzing the entire artifact collection, I only analyzed the four completely excavated units (units 36, 41, 46, 51). The artifacts analyzed are located at the Museum of the North and in the Togiak Cultural Center. For the four units there are 123 culturally modified *teggalquq* [stones], 126 culturally modified faunal organics, 105 culturally modified *murak* [wood] and 149 pottery sherds.

5.1.1 Culturally Modified Teggalquq [Stones]

Culturally modified *teggalquq* [stones] are primarily ground and chipped slate tools, as well as, *ellitet* [whetstones], *passin* [pestles], *kepun* [adzes], hammerstones and fire modified

rock (FMR). I analyzed the culturally modified *teggalquq* [stones] according to raw material type, Yup'ik characteristics, possible acquisition locations, tool production, functionality, gender use, age use, seasonality of use and discard patterns.

I identified raw material types using online reference collections and comparative materials housed at the University of Alaska Fairbanks. To identify Yup'ik stone characteristics, I used oral traditional literature and ethnographic sources. Sources used to identify Yup'ik characteristics include Fienup-Riordan 2007, Fienup-Riordan *et al.* 2015 and Jacobson 2012. The characteristics analyzed, located in Table 5.1, include *teggalqupiaq* [a genuine rock], *qetruk* [hard stones], *ulukaq* [dark slate], *ellitet* [whetstones], *lingarna*t [basalt good for heating], *arviiq* [hard brown/black granite], kukupat [marbled grey slate], *nagaayuq* [stones formed by water], *uqu'urniq* [light-colored sandy stone. I analyzed these characteristics by assessing *teggalquq* [stone] type, color, abrasiveness, texture, technological use and use-wear patterns (see Table 5.1).

Table 5.1 Yup'ik *Teggalquq* [Stone] Characteristics and Collection Locations. This table includes the Yup'ik stone characteristics, the methods of analysis, the English description and the possible acquisition locations.

Culturally Modified Teggalquq [Stone] Characteristics			
Yup'ik Name	English Description	Analysis Methods	Location
Teggalqupiaq	A genuine rock; cannot be broken by fire	All rocks not easily broken by fire, or not easily manipulated by other stone.	Hard coastal outcrops (Fienup-Riordan 2007)
Qetruk	Hard stone; cannot be broken by fire	Not easily manipulated by other stone according to	Unknown
Nagaayuq	Stone in water	River rocks	Unknown
Iingarnat	Basalt, volcanic rock; good for steam bathing, stone heating and heat therapy for healing	Porous basalts	Unknown
Ulukaq	Black slate; considered a soft stone	Black slate	Bristol Bay—Togiak area (Fienup-Riordan 2007; Fienup-Riordan *et al.* 2015)
Keggalrutet	Pumice; polishing instrument for wood and bone	Pumice	Found on the shore or floating in the surf of the Bering Sea and in the Bristol Bay (Fienup-Riordan *et al.* 2015)
Kukupat	Slate; dark with light spots-stones one can easily carve	Marbled grey and black slate	Security Cove (Fienup-Riordan *et al.* 2015)
Ellitet	Whetstones; considered a genuine rock; tend to break easily	Siltstone or sandstone tools with whetstone use-wear patterns	Unknown
Arviiq	A genuine rock; an abrasive whetstone; brownish and black; preferred stone for sharpening *uluaq*	Hard granite with whetstone use-wear patterns	Arviiq [Platinum] area (Fienup-Riordan *et al.* 2015)
Uqu'urniq	A light, sandy colored whetstone	Light colored siltstones and sandstones with whetstone use-wear patterns	Unknown

Raw material source locations are defined by Elders from the Bristol Bay Region in Fienup-Riordan 2007 and Fienup-Riordan *et al.* 2015 (Table 5.1). Elders state that *kukupat*, a dark slate with marbled grey spots, can be collected to the west of *Tuyuryaq* in the Security Cove

area (Fienup-Riordan 2007; Fienup-Riordan *et al.* 2015). While Elders source *ulukaq*, the black slate, nearby to *Tuyuryaq*, without a definite location (Fienup-Riordan *et al.* 2015). Elders also identify *Arviiq* [Platinum] as the location of *arviiq,* a hard brown or black granite, used primarily as an *ellitet* [whetstone] for sharpening *uluaq* [ulus] (Fienup-Riordan 2007; Fienup-Riordan *et al* 2015). I assessed the raw material types and determined the source locations based solely on appearance. In the future, it would serve to analyze the materials using geochemical analysis.

After analyzing the Yup'ik characteristics, I evaluated the production of tools according to standard archaeological analysis. Analysis included examining the snapping, chipping, polishing, grinding, hafting or beveling of the culturally modified *teggalquq* [stones]. For the evaluation of the slate fragments, I implemented Graesch's (2007) six-stage production system. Graesch's (2007) stages included: Stage 1) raw material acquisition and cobble reduction, Stage 2) edge modification, perimeter chipping, thinning, fractures, Stage 3) slate grinding—unifacial grinding, Stage 4) slate grinding—bifacial grinding, Stage 5) hafting; hafting holes, wear or attached wood or faunal hafts, and Stage 6) bifacial beveling or the grinding of the opposite side of point to dull edge from hafting or to hold with hand (Graesch 2007).

I then analyzed tool discard patterns with a hand-held lens. Discard patterns included use-marks, breakage and burning. Each tool was examined for the presence or absence of use-marks and the location of marks were identified. Use breaks were also noted, and and evidence of burning was listed and assigned a color.

The gender, age and seasonality of tool use were assessed through Yup'ik ethnographic and oral tradition sources including Blue 2007; Fienup-Riordan 2007; Fienup-Riordan and Reardan 2016; Fienup-Riordan *et al.* 2015, John 2003; John 2007. Although traditional Yup'ik gender constructs are more fluid than in the Western, there are specific tools associated with primarily female or male tasks. For example, the women's knife, or the *uluaq* [ulu], is a tool specifically wielded by women for cutting. Thus, I assigned tools to the gender they were traditionally used. If a tool was used by both genders it was considered a dual use tool. Tools were also identified if possible as adult or child. Children's tools were distinguishable because of their smaller size. Lastly, I assigned seasonality of tools based on the time of year the tool was used in the Yup'ik seasonal cycle.

5.1.2 Culturally Modified Faunal Organics

I identified the culturally modified faunal organics to the most discrete taxonomic class possible including taxon (land mammal, sea mammal or aves), family, genus, and species using the University of Alaska Fairbanks Department of Anthropology's Zooarchaeological comparative collection (Cannon 1987; Gilbert 1990). I then classified the remains to material type including cortical bone, cancellous bone, calcine bone, antler, enamel (tooth/claw) or ivory. Then, if possible, I assessed the bone's element.

To understand burning patterns, I used Shipman *et al.'s* (1984) burn codes. Burn codes were identified based on the bone's color and texture. Color and texture analysis was used to differentiate between burning, staining and weathering. Once the burn was identified, the burn color codes included brown, brown/black, black, grey, blue, grey/white, and white. I then analyzed weathering patterns to assess the relationship of the bone preservation to environmental factors according to Behrensmeyer's (1978) five-stage model. Weathering values ranged from 0 to 5; 0 signifying no weathering and 5 signifying the bone as unrecognizable due to cracking and complete exfoliation (Behrensmeyer 1978). I then identified traditional hunting locations using modern *Tuyuryaq* residents hunting zones found in Fall *et al.* 2012.

I identified the typology of culturally modified faunal organic tools using online resources including Smithsonian Institute's Alaska Native Knowledge Collections (https://alaska.si.edu), the Burke Museum Ethnology Collections Database (http://www.burkemuseum.org), local knowledge from *Nutaraq Tuyuryaq* [New Togiak] and ethnographic literature reviews (Fienup-Riordan 2007; Fienup-Riordan and Reardan 2016; Fienup-Riordan *et al.* 2015). To examine techniques of tool production, I visually identified chipping, polishing and grinding patterns. To examine tool discard, a hand-held lens was used to assess breaking, chipping and cutting.

I assessed seasonality of the tool use based on the time of year that Yup'ik groups traditionally used the tool. Many of the tools were used in all seasons or in more than one season. The gender of tool usage was assigned to female, male or dual according to which task the tool was traditionally associated (Blue 2007; Fienup-Riordan 2007, 2012; Fienup-Riordan *et al.* 2015; John 2003; John 2010). Age categories included adult and child.

5.1.3 Culturally Modified Murak [Wood]

I first identified culturally modified *murak* [wood] materials as angiosperm (hardwood) or conifer (softwood). Identification of angiosperms and conifers was performed with a hand-held lens based on grain size, grain patterns, grain texture, porousness, hardness, growth rings, rays, and bands (see Panshin and Zeeuw 1964). Although species were not analyzed, angiosperms (hardwoods) from the region include *elnguq* [birch (*Betula spp.*)], *avngulek* [cottonwood (*Populus sect Aigeros*)], *cuyanguaq* [willow (*Salix spp.*)], and *auguqsuliq* [alder (*Almus spp.*)], while conifers (softwoods) include *equgpigaq* [Spruce (*Picea spp.*)], cedar [*Cedrus spp.]* and hemlock [*Tsugua heterophylla*] (Alix and Brewster 2004; Prentiss and Barnett 2017).

I used the identification of angiosperms (hardwood) and conifers (softwood) to decipher the location of *murak* [wood] collection. Through interviews with *Tuyuryaq* residents, researchers Wheeler and Alix (2004) identified all angiosperms (hardwoods) as from greenwood from the Togiak River or from local collection in the Togiak Bay. Alternatively, *Tuyuyraq* residents collect conifers (softwood) 30-40 km down the ocean shore or along the local islands, floating from the Kuskokwim delta and southeast Alaska (Wheeler and Alix 2004).

I then analyzed the Yup'ik *murak* [wood] characteristics defined in Table 5.2. As a non-Yup'ik researcher, I did not feel comfortable assigning many of the Yup'ik characteristics, but I felt the need to include a variety of the wide-ranging characteristics. The number of characteristics illustrated in the Table 5.2 is a testament to the deep knowledge of Yup'ik woodworking.

Table 5.2 Yup'ik Murak [Wood] Characteristics and Use. This table includes the Yup'ik name, the English name and *murak* [wood] uses. The characteristics in bold were used in analysis.

Culturally Modified *Murak* [Wood] Characteristics		
Yup'ik Name	English Definition	Uses
Unarciaq	**Straight-grained wood**	**Straight part of trunk; fish traps/drying racks/kayaks/shafts/stringers/handles**
Tegg'eraq	**Hardwood**	**Architecture/binding material/nails/bows**
Qapugyaq	**Softwood**	**Good for materials needing bending kayak ribs/bentwood buckets and bowls/fish trap (rots easily)**
Qeluvkalriit	Wood bent as if under pressure	Mixed-grain wood—wood easy to bend
Avuaralget	**Mixed-grained wood**	**Kayak ribs/binding material/bentwood buckets and bowls**
Pag'acngat	**Close-grained; rings close together**	**Unknown**
Akqurrilnguq	**Wood without knots**	**Straight-grain—Easy to split for architecture and tools/ easy to bend and make into bentwood rims**
Akqut	**Wood with knots**	**Mixed-grain—Hard to use for toolmaking used to start fires**
Elngulria	Strong, pliable wood	Bentwood rims
Mecuq	Waterlogged wood	Hardwood that is not good for woodworking or burning
Eskaaniq	Soft, porous wood	Not used
Equgcilria	**Smooth wood that twists slightly**	**Mixed-grain wood—bentwood material/drums/kayak ribs/ladles/spoons/containers/masks**
Equk	Wood light enough to carry on shoulders	Unknown
Mikurneq	Straight-grained/ hardwood	A combination of *Unarciaq* and *Tegg'eraq*
Naucit	Dry, dead wood	Unknown
Unrapigaq	Small, thin driftwood	Unknown
Arumalria Murak	Rotten wood	Useless due to soft, porous interior. Not used for firewood because it has bad smoke
Kenqeggialnguq	Wood that doesn't burn well	Doesn't give much heat if burnt or gives off too much head to use for cooking (birch, larch, and red alder)
Uivutkaq/ Naucit	Dry, burnable wood	Wood good to burn in fires and for smoking fish (cottonwood driftwood, willow, and alder)

I then analyzed the culturally modified *murak* [wood] to grain type, grain direction, and texture. Grain type was identified as straight grained, wavy grained, spiral grained and oblique grained. In straight grain the fibers run parallel to the center of the log with no knots. In wavy grain, the fiber waves parallel to the center of the log due to knotting. Spiral grains form when the log twists while alive creating a spiral shape towards the center, while oblique grains form when the board is cut oblique to the center of the board.

I also analyzed the culturally modified *murak* [wood] based on grain type, grain direction, and texture. Grain type was assigned as straight grained, wavy grained, spiral grained, and oblique grained illustrated in Figure 5.1. In straight grained samples, the fibers ran parallel to the center of the log with no knots. In wavy grained samples, the fiber waved parallel to the center of the log due to knotting. Spiral grains formed when the log twisted while alive creating a spiral shape towards the center, while oblique grains formed when the board was cut oblique to the center of the board. Grain direction was assessed based on the direction the grain was running along the length of the tool. The direction was described as longitudinal, diagonal, or oblique. For longitudinally grained samples, the direction of the tool was parallel to the grain direction. For diagonally grained samples, the tool was made when a straight grained log was cut diagonally toward the center, rather than a parallel cut. Lastly, oblique grain direction occurred when the log was cut in a way to make the grain seem oblique to the tool. Grain texture refers to the size of the pores, with a fine grain texture having small pores and a coarse grain texture having large and open pores.

I also explored the gender use, age use, and seasonality of the culturally modified *murak* [wood]. Gender tool usage included dual use, female, and male use. Tasks associated with male tools included activities like large mammal hunting equipment, while women's tools included utensils associated with cooking. Age use was separated to adult and child, children's items were defined either play toys or small versions of adult tools. Lastly, seasonality was separated by the time of year the tool was used. Some tools were used yearly or in multiple seasons. I assessed gender, age, and seasonality based on using oral traditional literature and ethnographic work found in Blue 2007, Fienup-Riordan 2007, 2012, 2016, Fienup-Riordan *et al.* 2007 and P. John 2003.

5.1.4 Pottery

I analyzed the pottery collection according to the matrix size, temper type, pottery color, burn, location, shape, and design. The matrix was assessed based on visibility and temper size. Temper size was measured with a hand-held lens and ranged from less than one centimeter, zero through one centimeter and greater than one centimeter. Temper was analyzed using a hand-held lens and the collection consisted of sand, gravel, feathers, shells and grass. The pottery color was then visually evaluated.

I then assessed the sherd type (rim, side, base) and the shape to explore discard patterns and the original object's size. Burning was analyzed to explore possible cooking techniques or discard patterns. Then I described the designs on the pots as lines, number of lines, dots, number of dots and shapes. As discussed by several *Nutaraq Tuyuryaq* [New Togiak] community members, the symbols may have represented familial designs and personal ownership.

5.2 Radiocarbon (C^{14}) Dating

A component of this thesis tests the continuity and change of the characteristics evaluated from the cultural remains throughout the occupation. Radiocarbon dating ($C^{14)}$ was performed on six antler wedges from units 36, 41, 46 and 51. I chose antler for dating because of its relative abundance compared to terrestrial mammal bones. I sent the samples to Direct AMS radiocarbon dating laboratory and calibrated the returned dates in Calib 7.0. I used the radiocarbon dates to create a model to distinguish separate occupations identified in each level of the excavation and to compare potential changes in the artifact assemblage composition over time.

The selected antler samples were closely associated with features, including clay-lined pits and thick deposits of artifacts (Figure 5.2). Antler remains associated with storage pits had UAMN accession numbers 1126, 2181 and 2824, while artifacts 1134 and 2730 were surrounded by thick deposits of cultural materials and compact floor depressions. Furthermore, antler remain 1134 was associated with a thick deposit of culturally modified *teggalquq* [stone], as well as, a dense deposit of *murak* [wood], which may have been a collapsed housepit. Antler remain 2817 was found directly above and below levels with thick artifact counts.

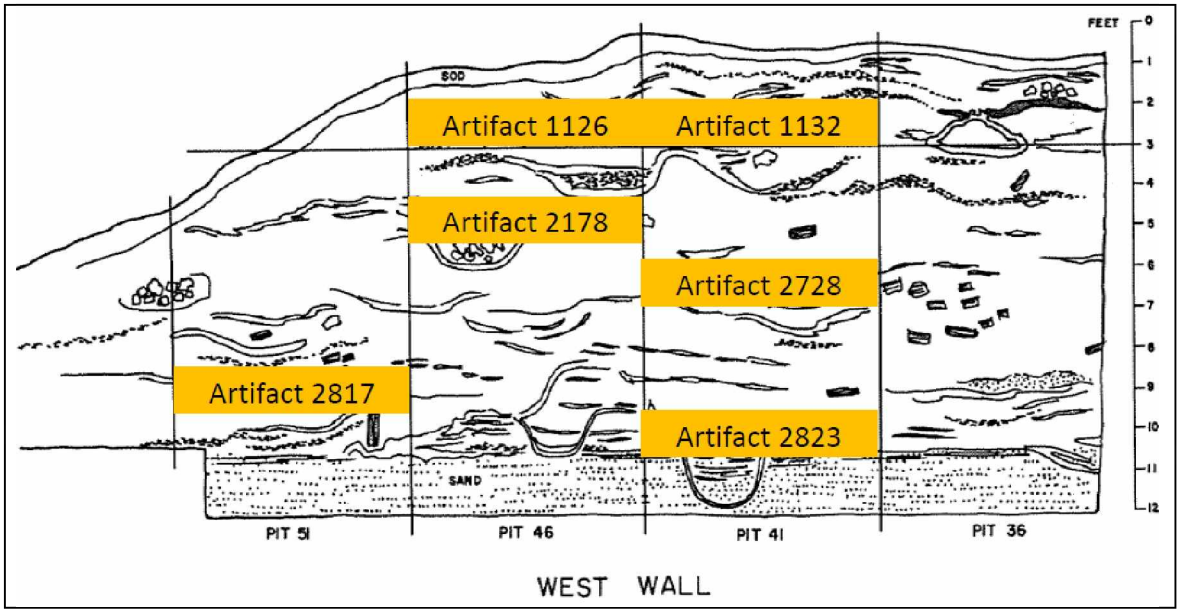

Figure 5.1 Antler Locations for Radiocarbon Dating. This figure illustrates the west profile wall drawn by Kowta (1963) and the accession numbers of the antler artifacts. Kowta 1963 Figure 3 TG-IA Wall Profiles.

5.2 Household Archaeology

The second objective of this thesis is to offer new interpretations of the built environment revealed during Kowta's (1963) excavation by analyzing the systems of activities and the system of settings described in Rapoport 1990. To explore the built environment, I constructed a GIS database of the excavation using Kowta's artifact catalog and profile drawings (1960, 1963). The construction of the database followed methods demonstrated in Birkenfeld *et al.*'s (2015) work on Wonderwerk Cave in South Africa. Birkenfeld *et al.* (2015) virtually created a site grid using the reverse stratigraphic reconstruction method. The reverse stratigraphic reconstruction method creates a virtual grid using the GIS fishnet tool, which builds a perfect grid based on excavation's latitude, longitude, rows and columns. Once the grid was constructed, the information from the recovered artifacts was placed in the appropriate units. Each level of the excavation was then represented by a new GIS layer (Birkenfeld *et al.* 2015).

To reconstruct the system of activities from the excavated area I created density models for 34 categories in each level, illustrated in Table 5.5. The 34 categories consisted of various material types, tool types or activities with associated tools. Each category is constructed to illustrate tasks associated with a system of activity in a Yup'ik household. Rapoport's (1990) system of settings analysis was then employed to explore how these activities represented

different traditional lifeways throughout the occupation of the excavated area. I assessed the systems of settings as multiple activities associated with similar settings. Traditional settings with similar activity systems are listed in Table 5.4. The density maps were used in attempt to understand areas where systems of settings were occuring during each level.

Table 5.3 Activity Systems-Density Categories. Density categories for materials and activities associated with traditional Yup'ik villages. Continues to next page.

Activity Systems Density Categories	
Material	Artifact types
Slate	The total count of all slate for the level
Fauna	The total count of all fauna for the level
Wood	The total count of all wood for the level
Pottery	If the unit had pottery it totaled to 1 because Dr. Kowta didn't retain pottery counts.
Stone	The total count of all stone for the level
Hide	The total count of all hide for the level
Fiber	The total count of fiber products for the level; including grass, plants, seeds
Whetstones	The total count of all whetstones for the level
Hammerstones	The total count of all hammerstones for the level
Shafts	The total count of all wooden shafts for the level
Hide Processing	Hide processing tools: scrapers and fish scalars
Clothing Production	Tools associated with clothing production: awls and needles
Food Production	Objects associated with the cooking and serving of food: cutting board, utensils, and pots
Storage	Objects associated with storing food: grass baskets, wooden boxes, pottery pots
Wood/Hide Processing	Wedge-shaped bone/antler tool for wood splitting or for hide working
Children's Toys	Toys or small objects associated with children's activities: Dolls, story knives, toy boats, small hunting equipment
Community	Community objects were shared, drum handle, masks, fire making equipment, buckets, baskets and oil lamps
Ornamentation	Objects associated with bodily ornamentation—labrets: medial labret and lateral labrets
Travel	Objects associated with traveling: Dog sled and kayak parts
War	Objects associated with war: slat armor
Cutting Tools	Objects associated with cutting activities: *Uluaq, Cavigaak* [men's knives] and all other blades
Snow/Ice Removal	Objects associated with removing snow and ice: Shovel blade ice scoops and ice picks
Fishing	Objects associated with fishing: Net weights, tomcod fishing rods, salmon spear, fish lure and fish spear prongs
Fishing/Fowling	Objects that could be associated with fishing or fowling: spear prongs, dart heads and dart prongs
Fowling	Objects associated with fowling: Bird darts, bird dart prongs, and bird net parts

Table 5.4 Activity Systems-Density Categories Continued. Density categories for materials and activities associated with traditional Yup'ik villages.

Activity Systems Density Categories	
Material	Artifact types
Hunting-Land	Objects associated with hunting large land mammals: Bows, arrow shafts, foreshafts, arrowhead points, spear shafts and lance heads
Hunting-Sea	Objects associated with hunting sea mammals: Throwing board, seal dart heads, dart shafts, harpoon sockets, harpoon heads, spear shafts and lance heads
Stone working	Objects associated with working stone: hammerstones, whetstones and engraver
Wood Working	Objects associated with working wood: Shaft straightener, engraver and bow drills
Fauna Working	Objects associated with working fauna: Hammerstones, whetstones, and soft hammerstones
Worked Slate	Slate that has been snapped, flaked or ground
Worked Fauna	Fauna that has been ground or flaked
Worked Wood	Wood that has been chipped, cut or ground

Table 5.5 Systems of Settings. Density categories for activities associated with traditional Yup'ik settings.

System of Settings	
Settings	Activities in Setting
Ena [Family House]	Food Production; Hide Processing; Clothing Production; Stone Working; Storage; Children's Toys; Community Objects: Masks, Drums, Baskets, Wooden Boxes, Oil Lamps and Fire Drills
Qasqiq [Men's Communal House]	Wood Processing; Kayak Building; Wood Working; Stone Working; Community Objects: Masks, Drums, Buckets, Oil Lamps and Fire Drills; Fishing; Hunting-Land/Sea; War
Fish Processing, Drying/Smoking	Hide Processing: Fish Scalars; Cutting Tools: Uluaq; Baskets; Pottery
External Cooking Locations	Food Production; Storage

5.2.1 A Yup'ik Village Model

To interpret the cultural and structural remains at *Temyiq Tuyuryaq*, the project required a traditional Yup'ik village model. I constructed the model based on indigenous knowledge, ethnographical literature and interviews with *Tuyuryaq* residents (Blue 2007; Fienup-Riordan 1983, 2007, 2012; Fienup-Riordan and Reardan 2016; Fienup-Riordan *et al.* 2015; Frink 2007, 2016; John 2003; John 2010; Nelson 1988; Oswalt 1990; Ross 1958; Yanez personal com. May 2017). Yup'ik people occupied coastal villages on a semi-permanent or permanent basis, having the heaviest occupation during the winter months while people were living in their respective

semi-subterranean sod houses (Fienup-Riordan 2007; Oswalt 1990). During the spring, summer and fall, people constructed seasonal camps for subsistence away from the village. However, the seasonal camps did not necessarily incorporate all the villagers, the old and young often remaining in the village (Fienup-Riordan 2007). Of the village features, four were the most prominent including the *qasqi* [men's community house], the *ena* [family house], the tunnels and the storage features (Fienup-Riordan 2007; Frink 2016; Oswalt 1990; Ross 1958).

The *qasqi* was a communal male house, where related men spent the majority of their time when in the village (Frink 2016; Nelson [1889] 1983); Ross 1958). The *qasqi* was the largest of the sod houses at a village, with a sunken entrance tunnel and as well as possible underground tunnels to the *ena* (Fienup-Riordan 2007; Frink 2016). The *qasqi* was always built from the center out. Using a long-twined string of sinew or grass, residents would start in the center and stretch the string into four corners. The builders would then mark the circle of sod to remove using the string, creating a perfect circle. Once excavated, four posts were positioned in the corners and a square building was constructed around the poles. First, the floor was constructed, which included a central fireplace and a long subterranean entrance tunnel under the fire. The floor and sides of the building were constructed with flat logs, while the roof was constructed using cross beams shaped into a pyramid-like structure. A window was then placed on top of the sod house and made with sewn seal gut or fish skin. Once the structure was complete, sod was packed into the outside, and woven grass mats were hung from the beams in the inside, insulating the structure. Benches were erected along all four corners stretching from post to post, which were also used by the men for sleeping and working, each having their own position in the *qasqi* (Fienup-Riordan 2007; Yanez person comm. May 2017).

Members of the *qasqi* included men and boys old enough to learn male associated tasks. In the village, the *qasqi* was where the men worked, relaxed, slept and enjoyed the heat of a sweat bath (Nelson [1889] 1983). Villages could have more than one *qasqi* depending on the number of occupants in the group and the availability of *tep'at* [driftwood] (Frink 2016; Nelson [1889] 1983). If there were more than one *qasqi* in a village, membership was based on relative association. Boys often joined their fathers or their mother's brother's respective *qasqi*. Membership at the *qasqi* was not exclusive to one house and villagers sometimes had ties to more than one *qasqi.* A man could also join another *qasqi* through marriage or if his association to members of another *qasqi* grew stronger. The *qasqiit* [plural] were also competitive, trying to

attract the best *nukalpiat* [hunters], strongest workers and best story tellers, drummers and dancers (Frink 2016; Nelson [1889] 1983; Oswalt 1990; Ross 1958).

In the q*asqi* each man had his respective position, which no one but him occupied. Along the western coast of Alaska, some of the men marked their positions with personal seal oil lamps, although it is unknown how far this tradition stretched south (Ross 1958). Nelson ([1889] 1983) noted that small logs were used to mark each man's position on the bench and were used as head rests during the night. Each sleeping and working position was indicative of the man's status among the group. Along the northern bench, or farthest from the entrance was where the Elders and most apt *nukalpiat* [great hunters] worked and slept. This bench also housed visitors (Frink 2016; Nelson [1889] 1983; Ross 1958). The next prestigious position was in the center of the bench along the east and west walls, or walls perpendicular to the entrance. Then the lower status individuals and orphans slept along the south wall or entrance wall (Fienup-Riordan 2007; Frink 2016; John 2003; Ross 1958). While men slept on the benches, boys slept on the floor by the man sponsoring him in the *qasqi* on a woven grass mat (Fienup-Riordan 2007; John 2003)

Women were only included in *qasqi* activities during three occasions. First was the daily task of bringing food to relatives. During this time the women, either the wife or child of a man, entered the *qasqi* and gave her relatives food. The women could choose to stay in the *qasqi* until the food was finished or she could return to retrieve the dishes later. Women were also allowed in the *qasqi* during ceremonies. In traditional ceremonies like the *Ilgariq* [Bladder Festival], women were integral players in the processing, safekeeping, and bringing of the bladders to the *qasqi* (Fienup-Riordan 2007; Frink 2016; John 2007). The third instance women were included in the activities of the *qasqi* was to sew skins for the outside of *qayaq* [kayaks]. This would often take many women working together and was finished in one afternoon (Fienup-Riordan 2007; Frink 2016; Oswalt 1990; Ross 1958).

In some cases, women entered the *qasqi* nightly for storytelling and dancing. During Frances Ross's (1958) time in western Alaska, she describes the nightly activities of dancing, drumming and storytelling among both men and women. However, the acceptance of women into the male space was dependent upon the village. In Ross's (1958) study across southwestern Alaska, she noted that in some instance's women were never allowed in the *qasqi*, a ceremonial building was erected instead.

There was a multitude of activities occurring in the *qasqi* as it hosted the men's work and relaxing space. Each man had his own set of tools, which would have included his hunting equipment and production tools. Tools could have included items such as *kepun* [adze], the *aivagun* [wedge], *cavigaak* [men's slate knives], *iguun* [bow drills], *ingcira'arcuutet* [ivory engraving tools], *iqukeggutet* [chisels], *kassugaliilssuun* [tool for making circle-and-dot design], *mellgar* [crooked knife], *imruyutaq* [net shuttles] and *negaqeggutet* [net gauges]. Tools were stored in caches under the benches of the *qasqi* or in the family *ena* (Fienup-Riordan 2007; John 2003).

Men also made larger items like the *qayaq* [kayaks] in the *qasqi* during the winter, the *murak* [wood] being prepared months in advance. The owner of the *qayaq* [kayak] perfectly constructed the boat using his own body measurements while women relatives entered the *qasqi* and place the outer skin on the *qayaq* [kayak], rubbing it with oil until becoming waterproof (Fienup-Riordan 2007). The man then painted his family designs on the *qayaq* [kayak] and construct paddles. One-bladed paddles were used in rivers, while two bladed paddles were used in the ocean (Blue 2007). The kayak was lifted out of the *qasqi* using the window and the it was stored near the *ena* (Blue 2007; Fienup-Riordan 2007; John 2003). Other traveling equipment prepared in the *qasqi* included *pupsugcetaat* [snowshoes] and *ikmraq* [dog sleds].

Communal equipment was also constructed in the *qasqi*. Ceremonial equipment hung from the ceiling and walls. *Cauyaq* [drums], *cauyaun* [drum handles] and avangcaq [masks] could have a personal owner or could be shared. Normally the man with the best woodworking skills would construct these tools and they were decorated with the circle-and-dot motifs of *ellam iinga*, the conceptual symbols of *Ellerpak* [awareness; the universe]. Ceremonial items were always burned when retired (Fienup-Riordan 2007; John 2003; John 2010). Other tools shared by the community included fire making materials, *qaltq* [buckets for water], *qalun* [water dipper], *qenuirissuun* [dipper for removing ice from holes], *qurrun* [urine buckets], *ussugcin* [sod-and-ice cutting tool] *qanikciurun* [snow shovel], *cikuliurun* [icepick], *kenurrat* [lamps], *aavacaaq* [playing darts], and fire bathing equipment (Fienup-Riordan 2007).

The *ena* [family house] housed multiple generations of women and children. Although only the women, children, sick and shamans lived in the *ena*, it was not considered a women's house in the same way the *qasqi* was considered a men's house (Frink 2016). The use of the *ena* was restrictive for men, but not completely limited. Men could join in meals at the *ena* and he could

store his tools and equipment in his wife's *ena* (Frink 2016; John 2003). Although welcome in the *ena*, "a man always was something of an outsider in the house where his wife lived" (Oswalt 1990: 21). An Elder from Chavek recalled that her grandmother, mother, two aunts and their children lived in the *ena,* and that it was the noisiest house she ever lived in (Frink 2016).

The *ena* was constructed less elaborately than the *qasqi,* however it was the central space for storing food and household equipment (Fink 2016; Yanez personal comm. May 2017). A string was used to construct the four corners, and the sod would be excavated in a rectangular shape (Yanez personal comm. May 2017). Against the four corners logs were placed at an angle against the roof's end beam. This created storage space in each corner. In the center of the floor was a hearth and an underground tunnel. The house was framed with wood and covered with sod, the roof given a cross-beam-like structure that supported a pointed top and open window. Along the walls were shelves that contained personal cooking equipment and all members had their own cooking tools and eating utensils. Each of the plates and bowls contained different patterns indicating who owned what dish (Fienup-Riordan 2007). There were no planks placed on the floor, only grass matts (Frink 2016; Feinup-Riordan 2007; Yanez personal comm. May 2017). Benches for sleeping and working were present in some *ena*; however, in others the house floor was dug lower in the center and raised on each side for sleeping. *Eniit* [plural] with close ties could be connected with a semi-subteranean tunnel, as well as connected to the *qasqi* (Fienup-Riordan 2007; Frink 2016; John 2003; Oswalt 1990; Ross 1958).

Many integral activities occurred in the women's house, primarily the cooking and storage of food items, hunting and fishing, hide processing, clothing production and the rearing of children. Women were the collectors of plant foods, grasses, mollusks, eggs, roe, as well as fishers and small game hunters (Blue 2007, Fienup-Riordan 2007; Frink 2007, 2016: Jernigan 2012; John 2010). Collection of these items involved the laborious process of butchering, storage and cooking. Plants, like berries, were collected and stored in baskets or pots of fatty oils. Berries were also stored inside seal gut bags in the permafrost or in frozen water (Frink 2007, 2016; Jernigan 2012). Additionally, women were the fishers and hunters and would often set nets in the ocean to pick fish when the tides were low, or snare small game and net fowl (Blue 2007; Fienup-Riordan 2007).

Along with hunting and fishing activities, women controlled the processing of all game (Blue 2007; Fienup-Riordan 2007; Frink 2016; John 2010). When a man brought game back to

the village or into the seasonal camp, it became the women's domain and responsibility (Frink 2009, 2016; John 2010). Processing the materials included removing edible and functional parts, taking care of the hides, teeth and claws, creating clothing, tools and ceremonial items from the remains, storing the remains and cooking them. Tools associated with the collection of plants, fish and small game/fowl could include small game and fowl snares, root diggers, *imryrtaq* [net shuttles], *negaqeggutet* [net gauges], *pugtaqutat* [net floats], *elluqutet* [slings], *taluutaq* [grass combs], *issran* [grass carrying bags], *kalngak* [storage grass bags], *mingqaat* [coiled baskets], *ayaruq* [walking sticks; also used for root digging], *qenuirissuun* [dipper for removing ice from holes], or tomcod jigging tools.

Winter cooking activities likely occurred in the house, however, during the warmer spring, summer and fall seasons cooking probably occurred outdoors to save the occupants from the intense heat given by the central fire (Frink 2007; Harry and Frink 2008). According to oral tradition and experiments done by archaeologists Harry and Frink (2008), cooking was likely done directly over the fire to save on rare *tep'at* [driftwood]. This could have been accomplished by placing pottery cooking vessel directly on the heat. When the water was hot, women would dip the frozen meat into the simmering vessel to parboil (Harry and Frink 2008). In the warmer seasons, cooking could have been done outdoors, likely directly over a fire or by smoking (Frink 2007; Harry and Frink 2008). Tools associated with cooking included fire starting equipment, *alvik* [large deep bowls], *angassat* [ladles], *luuskat* [spoons], *massiarcuun* [pestle], *mervitt* [water containers], *piicikaq* [birch-bark buckets], *qaluurin* [dippers], *qantat* [bowls], *uluaq* [ulu], and pottery vessels.

Clothing production was another essential activity completed by women. Clothing was made from hides, fish skin, intestines, and grass. Without critical attention given to the production of clothing it could mean death during the cold seasons (Fienup-Riordan 2007). Clothing production was also of the earliest task's adults taught young girls by sewing clothing for *imuguat* [family dolls] (Fienup-Riordan 2007; John 2010). Tools of clothing production could include *akngirnailitat* [thimbles], *anguarutnguat* [three-cornered skin-sewing needles], *assipek* [skin scraper], *aqimcissuun* [tool to soften skin], *ciilat* [needles], *kakivik* [sewing bag], *qunavutet* [sinew splinter].

Other important features of traditional villages included the elaborate tunnel and storage systems. Tunnels were constructed as the entrances and exits, as well as, house connectors.

Tunnels were dug and the floor and sides were lined with planked *tep'at* [driftwood], the roof was supported by logs (Fienup-Riordan 2007; Frink 2016). The tunnels could have storage lining the sides, areas for cooking, as well as, places for dogs to live and sleep during the winter (Frink 2016; Nelson [1899] 1983). Tunnels that connected houses were also associated with wartime and were built for escape or to avoid smoke and fire (Frink 2007, 2016).

Storage features shared a common theme across the coastal arctic including lined pits dug into the bottom of the house floor (Frink 2016). Food was stored in these pits using baskets, pottery, and grass. Storage pits could line the house, the tunnels or be in noted locations outside (Blue 2007; Fienup-Riordan 2007; Frink 2007, 2016). Above ground caches were also employed during the early colonial period (Frink 2016).

Other notable semi-permanent features included fish drying racks and smoke houses. Fish racks were constructed in the village and at seasonal camps. The racks consisted of a frame tied together with multiple logs for hanging fish. Smaller fish like tomcod were hung from woven grass and dried (Fienup-Riordan 2007). Smoke houses were constructed using sod as well as using a tripod frame with a hide around it. Heat and smoke were used for preserving fish, hides and firing clay (Fienup-Riordan 2007; Harry and Frink 2008).

The village underwent the processes of household change rapidly because the melting sod and permafrost would make the insides of the houses unlivable. Elders mention having to repair and reconstruct the sod houses every fall (Fienup-Riordan 2007). Repairing houses included mending broken boards, laying new floor and sod, and weaving new grass mats. The community built new houses when old ones were beyond repair or as a cycle of rejuvenation (Fienup-Riordan 2007; Frink 2016). All salvageable items from the old house were taken including much of the constructive material. A new house could be constructed in the same spot or a new location. In order to infill gaps between the sod houses, midden material was laid from the designated discard pile (Fienup-Riordan 2007; Prentiss and Barnett 2017).

5.3 The Little Ice Age

The third objective of this thesis is to assess if the cooling climatic conditions of the Little Ice Age caused the material remains and the built environment of *Temyiq Tuyuryaq* to change. To examine possible changes in the material culture, I defined each artifact as happening before the Little Ice Age or during and after the Little Ice Age and used a Mann-Whitney U analytical test to examine the differences in characteristics of the artifact assemblage over time. To test the continuity and change of the built environment, I analyzed the density models level-by-level to explore activities before and after the Little Ice Age.

Researchers consider the Little Ice Age a period of punctuated cooling occurring in the northern hemisphere beginning circa 500 BP, peaking in 350 BP and ending around 200 BP (Bradley and Jones 1993; D'Arrigo and Jacoby 1992; D'Arrigo *et al.* 2005; Lawson *et al.* 2010; Mann *et al.* 2002). During the Little Ice Age, the northern hemisphere was on average .8°C cooler than in the 20th century (Mann *et al.* 2002). Glaciological studies indicate glaciers in southeastern, Alaska and the Brooks Range expanded in size from 400 BP and reached their maximum size at 370 BP, before receding again (Crowell and Howell 2013; Lawson *et al.* 2010 Mason *et al.* 2019). Surging glaciation caused isostatic depressions in Southeastern Alaska, increasing the relative sea level to about 4m above current height, as well as decreasing precipitation in interior Alaska (Crowell and Howell 2013; Sikorski *et al.* 2009). In addition to cooling temperatures, the Little Ice Age resulted in expanding sea ice and punctuated ocean storminess (Gigleux *et al.* 2017; Lawson *et al* 2010; Mason *et al.* 2019).

Paleoocenographic records indicate a shift to high productivity in fish and sea mammals during the Little Ice Age associated with cooling temperatures (Maschner *et al.* 2009). The increase in productivity led to upsurge of salmon species, *asveq* [walrus (*Odobenus rosmarus*)] and *apakcuk* [stellar sea lions (Emetopias *jubatus*)] along the *Ugaassat* [Alaska Peninsula] (Maschner *et al.* 2009). Near *Arviiq* [Platinum], Quinhagak, and south of the Ahklun Mountain Range, strontium levels of caribou bones revealed shorter coastal migration routes, pushing the animals closer to villages during the Little Ice Age (Gigleux *et al.* 2017). In *Nuvupigaq* [Lower Alaska Peninsula and the Aleutian Island] and southeastern Alaskan villages there was an increase of mollusk use (Maschner *et al.* 2009). Archaeologists interpret the increase in sea mammal, fish and possibly coastal caribou abundances as cause for the increase in sedentary, corporate villages along the southern coast (Maschner *et al.* 2009; Mason *et al.* 2019). Maschner

et al. (2009: 49) suggested the "period of primary productivity must have led to a social and cultural boom".

The goal of objective three is to test the economic 'boom' against remains from the *Temyiq Tuyuryaq* village. If there was a dramatic increase in ocean productivity, I expect to see an increase in sea mammal hunting and fishing technology and an increase in material remains suggesting sedentism, such as pottery. To test this hypothesis, I placed all the cultural remains dating from 500 BP and earlier into the category of during/after the Little Ice Age, while the remains dating from 500 BP and after were before the Little Ice Age. Cultural remains from before the Little Ice Age and after/during the Little Ice Age were analytically compared to explore whether the cooling trend significantly transformed the way tools were produced, used and discarded.

To decide which analytical test to use, I checked the distribution of the *Temyiq Tuyuryaq* sample using a Shapiro-Wilk test and determined that not all data the was normally distributed. The Mann-Whitney U test was chosen for analysis because it does not assume a normal distribution of data and it specifically analyzes two independent variables (the two climate regimes). I applied the Mann-Whitney U to each category: tool production, use, wear, gender use, age use and seasonality of use.

Chapter 6

Results: Culturally Modified Remains

6.1 Radiocarbon (C^{14}) Dating Results

The calibrated C^{14} dates from level 24-36 (in) to level 120-132 (in) span from 507 cal BP to 604 cal BP. Antler 1132 [level 24-36 (in)] dates to 1104 cal BP and was not used in this analysis. Although the 2015 radiocarbon materials contain dates older than 1000 cal BP (Prentiss and Barnett 2017), the dates from Kowta's materials do not support an occupation older than 604 cal BP. The 2015 radiocarbon dates from cores 29.1 and 29.2, near the excavation, also support an occupation between 350 cal BP and 500 cal BP (Barnett personal comm. 2018). However, the occupation levels were not as straight forward as they seem.

In section 5.2.1 I explored traditional Yup'ik village household cycles, including the building, use, and dissembling of *qasqiit* [men's communal houses; plural] and *enaat* [family houses; plural]. In addition to the households, there were outside activity locals and extensive midden composites. The jumble of household contexts and fill material, plus the lack of information regarding the excavated deposits, posed a problem in dating the occupation levels. To rectify the lack of information, I used very liberal occupation ranges. The occupation ranges were generated with C^{14} dates closely associated to features in Kowta's (1963) profile drawings.

To create ranges, I situated the C^{14} dates against the western profile drawing, the closest associated wall (Figure 6.2). The only cultural features in the western wall were pits and thick deposits of wood, while the northern wall contained a large housepit with associated storage pits (Figure 6.1) (Kowta 1963). The housepit potentially had three floor levels and an associated wooden floor and entryway (Figure 6.1). The thick deposit of wood, related to the bottom of the housepit, stretched into the western profile near artifacts 2728 and 2817. Both the culturally modified antler dated to around 550 cal BP. Artifact 2178 was associated storage pit occurring in the same level as the possible housepit occupation. Artifact 2178 was C^{14} dated to 458 cal BP. Artifact 2823 was of the oldest material, 604 cal BP, and was associated with the top of a storage pit dug into the sterile sand.

The youngest occupation range was the most difficult to assess because level 24-36 (in) dated to 507 cal BP and to 1104 cal BP, while level 48-60 (in) dated to 458 cal BP. Since the C^{14} date of artifact 2178 (458 cal BP) was associated with a storage pit, I considered it the most reliable starting point. Thus, level 48-60 (in) to level 72-84(in) dated to 450-550 cal BP. Level

84-96 (in) to level 108-120 (in) dated to 550-600 cal BP. The final level, 120-132 (in) dated to 600 cal BP. To account for the jumbled early levels, I estimated level 12-24 (in) to 48-60 (in) to date circa 400-500 cal BP and earlier occupations to less than 400 cal BP (Figure 6.2).

Table 6.1 DirectAMS Radiocarbon Results. Results of the DirectAMS C^{14} analysis, including sample type, error and uncalibrated dates.

Submitter ID	Sample type	Fraction of modern		Radiocarbon age	
		pMC	1σ error	BP	1σ error
1126	collagen	94.64	0.30	443	25
1132	collagen	86.43	0.28	1171	26
2178	collagen	95.38	0.28	380	24
2728	collagen	93.48	0.25	542	21
2817	collagen	93.39	0.26	549	22
2823	collagen	92.73	0.28	606	24

Table 6.2 Calibrated Radiocarbon Dates. The depth, material, calibrated date range, probability distribution, mean probability and calibrated C^{14} dates for the six antler remains. Calibrated C^{14} date from 1132 was not used in analysis; thus, the age of the site ranged from 458 cal BP to 604 cal BP.

Sample ID	Depth (IN)	Material	UnCal C14 BP	Cal C14 BP- 2 Sigma 95.4%	Reimer *et al.* 2013 Probability Distribution	Median Probability	Cal C14 AD
1126	24-36	Antler	443+/-25	477-528 Cal BP	1.000	507 Cal BP	1443 Cal AD
1132	24-36	Antler	1171+/-26	1049-1178 Cal BP	0.892	1104 Cal BP	846 Cal AD
2178	48-60	Antler	380+/-24	428-504 Cal BP	0.709	458 Cal BP	1492 Cal AD
2728	72-84	Antler	542+/-21	520-558 Cal BP	0.777	544 Cal BP	1406 Cal AD
2817	108-120	Antler	549+/-22	523-559 Cal BP	0.660	549 Cal BP	1401 Cal AD
2823	120-132	Antler	606+/-24	579-652 Cal BP	0.771	604 Cal BP	1346 Cal AD

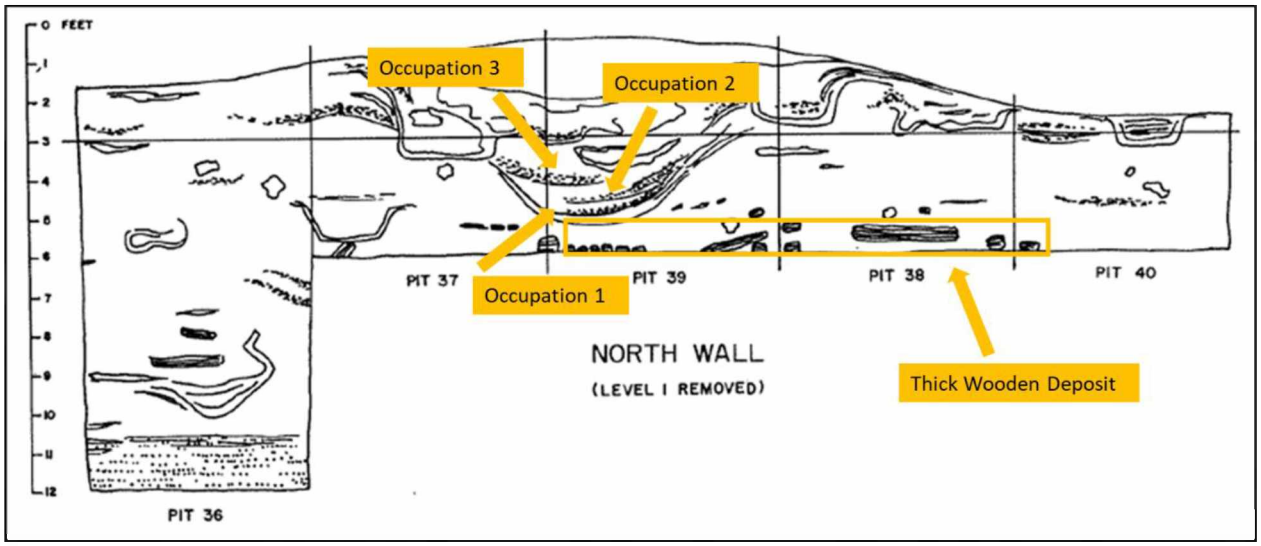

Figure 6.1 Housepit in North Profile Wall. Kowta (1963) north profile wall with housepit occupation levels. The thick wooden deposit below the housepit is also illustrated. Kowta 1963 Figure 3 TG-IA Wall Profiles.

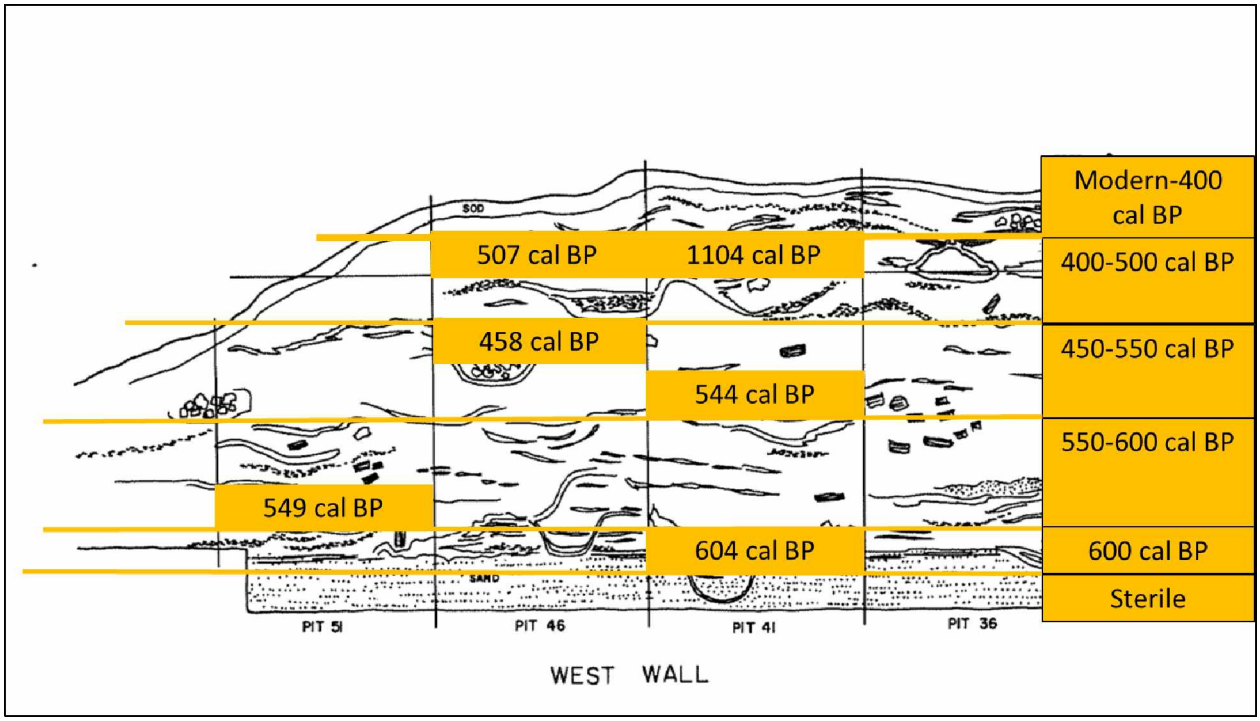

Figure 6.2 Radiocarbon Ranges. West profile wall from Kowta (1963) with associated calibrated C^{14} dates and date ranges. The calibrated C^{14} dates are illustrated by level and unit proper, while the date ranges correspond to multiple levels and units. Kowta 1963 Figure 3 TG-IA Wall Profiles.

6.2 Culturally Modified *Teggalquq* [Stone]

Culturally modified *teggalquq* [stones] from the *Temyiq Tuyuryaq* include slate blade fragments, fire modified rock (FMR), *ellitet* [whetstones], *cingilek* [arrowheads], *cavek* [harpoons], *qalugyaq* [lance points], hammerstones, *uluaq* [ulus], *caviggaak* [men's knives], *egturun* [adze blades] and *passin* [pestles]. Table 6.3 illustrates the count of *teggalquq* [stone] by time range (cal BP).

Table 6.3 Culturally Modified *Teggalquq* [Stone] Technology. The culturally modified *teggalquq* [stone] technology by corresponding occupation range (cal BP).

Culturally Modified *Teggalquq* [Stone] Technology					
	Modern-400	400-500	450-550	550-600	600
Blade Fragment	1		5	4	
Knife Blades	1		3		
Flat Stone/Flagging Stone	1		3		
FMR			3	3	
Ellitet [Whetstone]			9	8	1
Cavek [Harpoon]					1
Harpoon/Arrow pt			1		
Qalugyaq [Lance Blade]			3		
Pebble Hammer			3	1	
Uluaq [Ulu]			3	3	1
Hammer Stone			2	1	
Keligaun [Scraper]			1	1	1
Axe Blade			1		
Passin [Pestles]			1	1	
Egturun [Adze Blades]			2	1	

Slate is the primary raw material source, followed by siltstone and sandstone. Granite, igneous rock/basalt and rhyolite are less abundant in the collection. Table 6.4 illustrates the total counts of raw materials, while Table 6.5 illustrates the mean values before the Little Ice Age and during/after the Little Ice Age. Of the raw materials, only slate has a mean value significantly higher during/after The Little Ice Age than before The Little Ice Age.

Colors of the culturally modified *teggalquq* [stone] include black, light grey, dark grey, blue/grey, green, tan, blue and marbled grey/black. According to analysis, the collection consists primarily of back and light grey materials. The percent of black *teggalquq* [stone] is higher from modern-400 cal BP and 400-500 cal BP, becoming less common in the older periods. Light grey

stones are consistent throughout the collection, peaking in 550-600 cal BP. Marbled black and grey follows, peaking at 600 cal BP and decreasing during the earlier periods. Dark grey *teggalquq* [stones] are consistently collected throughout the whole occupation, but occur less often than the rest of the *teggalquq* [stones]. Blue/grey, green, tan and blue are rare throughout the entire occupation. The black materials have a significantly higher mean during/after the Little Ice Age than before, while the marbled grey/black has a significantly higher mean before the Little Ice Age.

Of the Yup'ik characteristics, the collection is primarily *ulukaq,* or dark slate. Table 6.4 illustrates that *ulukaq* [slate] is used more often than other types of materials, especially during the village's later dates (modern-400 cal BP). *Ulukaq* [dark slate] is used less in the older occupation; completely disappearing in 450-550 cal BP. T*eggalqupiag* [genuine stones] and *qetruk* [hard stones] remain steady throughout all occupation levels increasing slightly from 550-600 cal BP. *Kukupat* [slate marbled with dark and light grey], vary in abundance throughout the total occupation, but is continually used throughout all levels. N*agaayug*, water rocks, are not abundant, nor used continually; however, their use increases during 450-550 cal BP. *Ellitet* [whetstones] and *uqu'urniq* [light colored, sandy whetstone] are in the collection more abundantly during 550-600 cal BP and 600BP than in the earlier dates. Lastly, *lingarnat* [basalts good for heating] and *arviiq* [hard, dark colored whetstones] are not abundant in the collection. *Lingarnat* [basalts good for heating] are potentially abundant, however not abundantly collected by Kowta (1963). *Arviiq* [hard, dark colored whetstone] is in the collection three times. Of the Yup'ik characteristics evaluated, only the mean of *ulukaq* [dark slate] has a mean significantly higher during/after The Little Ice Age than before The Little Ice Age.

Elders local to, or near the Bristol Bay area, gave three potential locations of raw material sources (Fienup-Riordan 2007; Fienup-Riordan *et al.* 2015). The relatively sourced tools are mainly *ulukaq* [black slate] material located near the *Tuyuryaq* area. The collection contains more *ulukaq* [black slate] during the younger occupation and slowly decreases in the older occupation. *Kukupat* [slate marbled with dark and light grey] from Security Cove is consistent throughout the collection spiking in modern-400 cal BP and dropping from 550-600 cal BP. The *arviiq* [hard, dark colored stones] located in *Arviiq* [Platinum], are rare, with a total of three samples. River rock is also rare and associated with stones found in nearby lakes and streams. Of

the culturally modified *teggalquq* [stone] collection, none of the locations have means significantly different from before to during/after the Little Ice Age.

The ground slate was evaluated according to Graesch's (2007) six stages of ground slate production. According to Table 6.4 the first stage of production is rare with less than five cultural remains identified. The second stage of production increases in the collection, peaking from 400-500 cal BP and significantly dropping during 450-500 cal BP and 550-600 cal BP. The third stage of production is constant throughout the occupation, except in 600 cal BP, when use decreases. The fourth and fifth stages of production follow a similar pattern with a peak in 400-500 cal BP and a drop from modern-400 and 550-600, none are found in 450-550 and 600 cal BP. The sixth stage of production is less than five tools with no tools from modern-400 cal BP and 600 cal BP. Of the ground slate stages of tool production, the mean of stage two is significantly higher from after the during/after the Little Ice Age than before.

In addition to the stages of ground slate tool production, I analyzed snapping, chipping, polishing and surface grinding. Of the culturally modified *teggalquq* [stone], the collection is primarily chipped and surface ground, while snapping constitutes as less than half of the material. Polishing shadows surface grinding. Snapped tools have a mean significantly higher from before the Little Ice Age than during/after.

Of gendered tool use, from modern-400 cal BP there are only two male tools and in 400-500 cal BP there are a similar number of male and female tools. In 450-550 cal BP there are more tools associated with male activities, in 550-600 cal BP there are only female and dual tools, lastly in 600 cal BP there are similar tools associated with male and female activities. The tools used by both genders are consistently high in 400-500 cal BP and 550-600 cal BP, but drop from 450-550 cal BP. Of the tools associated with gendered tasks, none of the tool's means are significantly different from during/after the Little Ice Age to before the Little Ice Age.

Table 6.4 Culturally Modified *Teggalquq* [Stone]. The total count of the culturally modified *teggalquq* [stone] analysis by corresponding time range (cal BP). Continues to next page.

Culturally Modified *Teggalquq* [Stones] Total Count					
	Modern-400	400-500	450-550	550-600	600
Raw Material					
Slate	9	34	4	12	3
Granite	1	5	1	1	
Siltstone	1	9	3	9	1
Igneous		1			
Sandstone		5		4	
Gneiss		1			
Basalt		1			
Rhyolite			1		
Unknown	1	4	3	7	2
Color					
Black	6	27	2	8	1
Light Grey	4	22	4	15	2
Dark Grey	1	4	1	2	
Blue/Grey		1			
Green		2			
Tan		1			
Blue			1		
Marbled Grey/Black			1	2	1
Yup'ik Characteristics					
Teggalqupiaq	2	20	4	13	2
Qetruk	2	20	4	13	2
Ulukaq	9	34		12	2
Lingarnat		2	1		
Kukupat	3	4	3	4	1
Ellitet		8		7	1
Arviiq		3		1	
Nagaayuq		5	3	1	
Uqu'urniq		9		8	1
Material Source Location					
Togiak Area	5	19	3	8	1
Security Cove	4	13	1	4	1
Arviiq [Platinum]		3		1	
River Rock		4		1	

Table 6.5 Culturally Modified *Teggalquq* [Stone] Continued. The total count of the culturally modified *teggalquq* [stone] analysis by corresponding time range (cal BP).

Culturally Modified *Teggalquq* [Stones] Total Count					
	Modern-400	400-500	450-550	550-600	600
Stages of Ground Tool Production					
Stage 1		1		3	
Stage 2	5	16	1	1	
Stage 3	2	2	2	3	
Stage 4	1	4		1	
Stage 5	1	8		2	
Stage 6					2
Production					
Snapped	5	15	1	3	2
Chipped	4	35	6	15	3
Polished	4	19		16	
Surface Grinding	5	24	3	14	4
Gender Tool Use					
Female		6		5	2
Male	1	5	1		1
Dual		14	4	12	
Season of Tool Use					
Spring	1	27	4	17	3
Summer	1	23	4	17	2
Fall	1	27	4	17	2
Winter	1	26	4	17	3
Summer	1	23	4	17	2

Table 6.6 Culturally Modified *Teggalquq* [Stone] Mann-Whitney U. The mean percentage of the culturally modified *teggalquq* [stones] from during/after the Little Ice Age and before the Little Ice Age, as well as, the Mann-Whitney U, Z test and assumed two-tailed significance. All significant tests are in bold and highlighted. Continues to next page.

Culturally Modified *Teggalquq* [Stones] Mann-Whitney U				
	Mean (%) During/After the Little Ice Age	Mean (%) Before the Little Ice Age	Z	Sig. (2-tailed)
Raw Material				
Slate	59	38	-2.268	**0.023**
Granite	8	4	-.928	0.353
Siltstone	14	24	-1.458	0.145
Igneous	1		-.828	0.408
Sandstone	7	8	-.240	0.811
Gneiss	1		-.828	0.408
Basalt	1		-8.28	0.408
Rhyolite		24	-1.208	0.227
Color				
Black	45	22	-2.626	**0.009**
Light Grey	34	42	-1.128	0.259
Dark Grey	7	6	-.187	0.852
Blue/Grey	1		-8.28	0.408
Green	3		-1.175	0.240
Tan	1		-.828	0.408
Blue		2	-1.208	0.227
Marbled Grey/Black		8	-2.447	**0.014**
Yup'ik Characteristics				
Teggalqupiaq	30	38	-.905	66
Qetruk	30	38	-.905	0.366
Ulukaq	59	36	-2.485	**0.013**
Lingarnat	3		-1.175	0.240
Kukupat	8	12	-.691	0.489
Ellitet	11	22	-1.657	0.097
Arviiq	4	2	-.645	0.519
Nagaayuq	7	2	-1.221	0.222
Uqu'urniq	12	24	-1.683	0.092
Material Source Location				
Togiak Area	33	24	-1.058	0.290
Security Cove	23	12	-1.571	0.116
Arviiq [Platinum]	4	2	-.645	0.519
River Rock	5	2	-.956	0.339

Table 6.7 Culturally Modified *Teggalquq* [Stone] Mann-Whitney U Continued. The mean percentage of the culturally modified *teggalquq* [stones] from during/after the Little Ice Age and before the Little Ice Age, as well as, the Mann-Whitney U, Z test and assumed two-tailed significance. All significant tests are in bold and highlighted.

Culturally Modified *Teggalquq* [Stones] Mann-Whitney U				
	Mean (%) During/After The Little Ice Age	Mean (%) Before The Little Ice Age	Z	Sig. (2-tailed)
Stages of Ground Tool Production				
Stage 1	1	2	-.270	.787
Stage 2	29	8	-2.800	**.005**
Stage 3	5	6	-.122	.903
Stage 4	7	4	-.667	.505
Stage 5	12	12	-.055	.957
Stage 6	3		-1.175	.240
Production				
Snapped	27	8	-2.665	**.008**
Chipped	53	46	-.806	.420
Polished	32	38	-.743	.458
Surface Grinding	40	42	-.251	.802
Gender Tool Use				
Female	8	14	-1.020	.308
Male	8	4	-.928	.353
Dual	19	32	-1.620	.105
Season of Tool Use				
Spring	37	48	-1.213	.225
Summer	32	46	-1.625	.104
Fall	37	46	-.996	.319
Winter	37	48	-1.213	.225

6.2.1 Blade Technology

Blade technology includes all blade fragments not identified to a specific tool. The total count of analyzed blade categories is in Table 6.6. All the blade tools are composed of slate except for one siltstone blade. In modern-400BP, 400-500BP and 450-550BP, 100% of the blade tools are slate, while in 550-600BP 75% (3 tools) are slate and 25% (1) are siltstone. The blade tools are primarily black, while light grey, dark grey and marbled black/grey are represented by single tools in multiple occupations. From modern-400 cal BP, 50% (1) of the collection are black and 50% (1) light grey. From 400-500 cal BP 86% (6) of the collection are black and 14% (1) are dark grey. In 450-550 cal BP, 100% (1) of the blade tools are marbled black/grey. From

550-600 cal BP 66% (2) of the collection are black, 33% (1) light grey and 33% (1) marbled. None of the collection is represented in 600 cal BP.

One tool is *teggalqupiag* [genuine stone] and *qetruk* [hardstone], while all other blade tools are *ulukaq* [dark slate] and *kukupat* [dark slate with light spots]. From modern-400 cal BP 100% (2) of the slate blades are *ulukaq* [dark slate] and 50% (1), *kukupat* [dark slate with light spots]. From 400-500 cal BP 100% (6) of the blades are *ulukaq* [dark slate]. In 450-550 cal BP 100% (1) of the blades are *ulukaq* [dark slate] and *kukupat* [dark slate with light spots]. From 550-600 cal BP 16% (1) of the blades are *teggalqupiag* [genuine stone], *qetnuk* [hard stone] and 50% (3) *ulukaq* [dark slate]. No blade tools are represented in 600 cal BP.

The blade tools were primarily chipped, polished, ground and bifacially edge-beveled. From modern-400 cal BP, 50% (1) of the blade tools are snapped, 100% (2) are surface ground, 50 % (1) are hafted and 100% (2) are bifacially ground. From 400-500 cal BP 100% (7) of the blade tools are chipped, 100% (7) are polished, 100% (7) are surface ground, 14% (1) are hafted, and 86% (6) are bifacially edge-beveled. From 450-550 cal BP 100% (1) of the blade tools are chipped and hafted. While from 550-600 cal BP 25% (1) of the blade tools are chipped, 100% (4) are polished, 75% (3) are surface ground, 25% (1) are hafted and 100% (4) are bifacially edge-beveled.

The blades also have associated use-wear and post-depositional breaking. From modern-400 cal BP 50% (1) of the blade tools have use-wear and 100% (2) of the tools have post-depositional breaking. From 400-500 cal BP 71% (5) of the blade tools have use-wear, 43% (3) are broken due to use and 57% (4) have post-depositional breaks. From 450-550 cal BP 100% (1) of the blade tools have use-wear and breakage, and then from 550-00 BP 60% (3) of the blade tools have use-wear and breakage, while 40% (2) are broken post deposition.

Table 6.8 Blade Tools Total Count. The analyzed categories of blade tools by corresponding occupation range.

Blade Tools					
	Modern-400	400-500	450-550	550-600	600
Source Material					
Slate	2	7	1	3	
Granite					
Siltstone				1	
Color					
Black	1	6		2	
Light Grey	1			1	
Dark Grey		1			
Marbled Grey/Black			1	1	
Collection Location					
Tuyuryaq Area	1	6		2	
Security Cove					
Arviqq [Platinum]			1	1	
Yup'ik Characteristic					
Teggalqupiaq				1	
Qetruk				1	
Ulukaq	2	7	1	3	
Kukupat	1		1	1	
Production					
Snapped	1	1			
Chipped		7	1	1	
Polished	1	7		4	
Surface Grinding	2	7		3	
Hafting	1	1	1	1	
Edge Beveling-Bifacial	2	6		4	
Discard					
Use-Wear	1	5	1	3	
Breakage- Use		3	1	3	
Breakage- Post Depositional	2	4		2	

6.2.2 Ellitet [Whetstones]

The Yup'ik use *ellitet* [whetstones] for shaping other materials including *teggalquq* [stones], fauna and *murak* [wood]. *Ellitet* [whetstones] are an essential component to the creation and maintenance of tools. These stones have to be abrasive and harder than the material they are working. *Ellitet* [whetstone] total count of analysis is in Table 6.7. In the collection, *ellitet*

[whetstones] are primarily siltstone, while three are sandstone and one is granite. From 400-500 cal BP 14% (1) are granite, while 71% (5) are siltstone and 14% (1) are sandstone. From 450-550 cal BP 100% (3) are siltstone. In 550-600 cal BP 75% (6) are siltstone and 25% (2) are sandstone.

Of the color, all but one *ellitet* [whetstone] are light grey, while one is dark grey. From 400-500 cal BP 100% (7) are light grey, from 450-550 cal BP 100% (3) are light grey, while in 550-600 cal BP 89% (8) are light grey and 11% (1) are dark grey. In 600 cal BP 100% (1) of the *ellitet* [whetstones] are light grey.

All the *ellitet* [whetstones] are considered *teggalqupiag* [genuine stone], *qetruk* [hard stone] and *ellitet* [whetstones]. From 400-55BP there are 86% (6) *uqu'urniq* [light, sandy whetstone]. From 450-550BP 100% (3) are *uqu'urniq* [light-colored sandy *ellitet*] and 11% (1) are *arviiq* [black/brownish whetstone] and 11% (1) are *nagaayuq* [stone found in water]. From 550-600BP 77% (7) are *uqu'urniq* [light-colored sandy *ellitet*] and at 600BP 100% (1) are *uqu'urniq* [light-colored sandy *ellitet*].

Only two of the *ellitet* [whetstones] were assigned collection locations. Both the stones are from *Arviiq* [Platinum] from 400-500 cal BP and 550-600 cal BP. The *ellitet* are a combination of chipped, polished and ground tools. During 400-500 cal BP 29% (2) of the *ellitet* [whetstones] are chipped, 71% (5) polished and 71% (5) ground. From 450-550 cal BP 67% (3) of the *ellitet* [whetstones] are ground. From 550-600BP 55% (5) are chipped, 67% (6) are polished and 77% (7) are ground. At 600BP 100% (1) of the *ellitet* [whetstones] are polished and ground.

All the *ellitet* [whetstones] have use-wear from 400-500 cal BP, 450-550 cal BP, 550-600 cal BP and 600 cal BP. From 400-500 cal BP 49% (2) *ellitet* [whetstones] have breakage from use and during 550-600 cal BP 11% (1) are broken from use.

Table 6.9 *Ellitet* [Whetstone] Total Count. The analyzed categories of *ellitet* [whetstones] by corresponding occupation range.

Ellitet [Whetstones]					
	Modern-400	400-500	450-550	550-600	600
Raw Material					
Granite		1			
Siltstone		5	3	6	1
Sandstone		1		2	
Color					
Light Grey		7	3	9	1
Dark Grey				1	
Yup'ik Characteristics					
Teggalqupiaq		7	3	8	1
Qetruk		7	3	8	1
Ellitet		7	3	9	1
Arviiq				1	1
Nagaayuq				1	
Uqu'urniq		6	3	7	1
Location of Collection					
Arviiq [Platnuim]		1		1	
Production					
Chipped		2		5	
Polished		5		6	1
Surface Grinding		6	2	7	1
Discard					
Use-Wear		7	3	9	1
Breakage-Use		2		1	

6.2.3 Pebble Hammerstones

The pebble hammerstone's raw material type consists of granite, siltstone and sandstone. The total count of pebble hammerstone analysis is in Table 6.8. From 400-500 cal BP 50% (2) of hammerstones are granite and 50% (2) are siltstone. From 550-600 cal BP 50% (1) are granite and 50% (1) are sandstone. The color of the pebble hammerstones are light grey, dark grey and green. From 400-500 cal BP 75% (3) are light grey and 25% (1) are green. From 550-600 cal BP 100% (2) of pebble hammerstones are light grey.

The pebble hammerstones are *teggalqupiaq* [genuine stone], *qetruk* [hard stone], *arviiq* [hard, dark colored stone], *nagaayuq* [water stones] and *uqu'urniq* [light colored, sandy stone]. From 400-500 cal BP 75% (3) are *teggalqupiaq* [genuine stones], 75% (3) are *qetruk* [hard stones], 25% (1) are arviiq [hard, dark colored stones] 50% (2) are *nagaayuq* [water stones] and 25% (1) are *uqu'urniq* [light colored, sandy stones]. From 550-600 cal BP 100% (2) are *teggalqupiag* [genuine stones] 100% (2) are *qetruk* [hard stones] and 50% (1) are *nagaayuq* [water stones]. The pebble hammerstones are relatively sourced to *Arviiq* [Platinum] and as river smoothed rock. From 400-500 cal BP 25% (1) of the hammerstone are from *Arviiq* [Platinum] and 50% (2) are river rock. In 550-600 cal BP 50% (1) of the hammerstones are river rock.

The pebble hammerstones are chipped, polished and surface ground. From 400-500 cal BP 50% (2) of the hammerstones are chipped and 25% (1) are ground. From 550-600 cal BP 50% (1) of the hammerstones are chipped and 50% (1) of the hammerstones are polished. All the pebble hammerstones have use-wear. From 400-500 cal BP 100% (4) of the hammerstones have use-wear and 75% (3) have breakage from use. From 550-600 cal BP 100% (2) of the hammerstones have use-wear and 50% (1) have breakage from use.

Table 6.10 Hammerstones Total Count. The analyzed categories of hammerstones by corresponding occupation range.

Hammerstones					
	Modern-400	400-500	450-550	550-600	600
Raw Material					
Granite		2		1	
Siltstone		1			
Sandstone				1	
Color					
Grey		1			
Light Grey		2		2	
Green		1			
Yup'ik Characteristics					
Teggalqupiaq		3		2	
Qetruk		3		2	
Ulukaq					
Lingarnat					
Kukupat					
Arviiq		1			
Nagaayuq		2		1	
Uqu'urniq		1			
Collection Location					
Arviiq [Platnuim]		1			
River Rock		2		1	
Production					
Chipped		2		1	
Polished				1	
Surface Grinding		1			
Discard					
Use-Wear		4		2	
Breakage-Use		3		1	

6.2.4 Kepun [Adzes]

The total count of *kepun* [adzes] categories of analysis is in Table 6.9. *Kepun* [adzes] are made from a variety of raw materials including slate, granite, sandstone and gneiss. From 400-500 cal BP 100% (1) of the *kepun* [adzes] are made from sandstone. From 450-500 BP 50 % (1) are made from granite and 50% (1) are made from gneiss. During 550-600 cal BP 100% (1) are made from slate.

Kepun [adze] color is light grey or blue. From 400-500 cal BP 100% (1) are blue, from 450-550 cal BP 50% (1) are light grey, while 50% (1) are blue and in 550-600 cal BP 100% (1) are light grey. *Kepun* [adzes] are *qetruk* [hard stone], *ulukaq* [slate], and *kukupat* [dark slate]. From 450-550 100% (2) of the *kepun* [adzes] are *qetruk* [hard stone]. From 550-600 cal BP 100% (1) are *ulukaq* [slate] and *kukupat* [dark slate]. Only one of the *kepun* [adzes] is relatively sourced to Security Cove from 550-600 cal BP.

The *kepun* [adzes] are chipped, polished, ground, hafted, and unifacial and bifacial edge beveled. From 400-500 cal BP 100% (1) are chipped, polished, ground, hafted and bifacially beveled. From 450-550 cal BP 100% (2) are chipped, and 50% are ground, hafted and unifacially beveled. From 550-600 cal BP 100% (1) are chipped and polished. There are use-wear signs on two of the *kepun* [adzes]. From 400-500BP 100% (1) of the *kepun* [adzes] have use-wear, while from 450-550 cal BP 50% (1) have use-wear.

Table 6.11 *Kepun* [Adze] Total Count. The analyzed categories of *kepun* [adzes] by corresponding occupation range.

Kepun [Adze]					
	Modern-400	400-500	450-550	550-600	600
Raw Material					
Slate				1	
Granite			1		
Sandstone		1			
Gneiss			1		
Color					
Grey			1		
Light Grey		1		1	
Blue			1		
Yup'ik Characteristics					
Qetruk			2		
Ulukaq				1	
Kukupat				1	
Collection Location					
Security Cove				1	
Production					
Chipped		1	2	1	
Polished		1		1	
Surface Grinding		1	1		
Hafting		1	1		
Edge Beveling-Unifacial			1		
Edge Beveling-Bifacial		1			
Discard					
Use-Wear		1	1		

6.2.5 Hunting Tools

Hunting tools consist of *cavek* [harpoons], *cingilek* [arrows] tips and *qalugyaq* [lance points]. All the hunting tools are from 400-500 cal BP and are made of slate. The colors are black or light grey. The total count of hunting tool's analysis is in Table 6.10. From 400-500 cal BP 75% (3) of the hunting tools are black, while 25% (1) are light grey. The hunting tools are either *ulukaq* [dark slate] or *kukupat* [dark slate with light spots]. From 400-500 cal BP 50% (2) of the hunting tools are *ulukaq* [dark slate], while 50% (2) are *kukupat* [dark slate with light spots]. The relative source locations are the *Tuyuryaq* area and Security Cove. From 400-500 cal

BP 50% (2) of the hunting tools are from the *Tuyuryaq* area and 50% (2) of the tools are from Security Cove.

The hunting tools are snapped, chipped, polished, ground, hafted, and bifacial edge beveled. From 400-500 cal BP 25% (1) of the hunting tools are snapped, 50% (2) are chipped, 50% (2) are polished, 50% (2) are ground, 25% (1) are hafted and 50% are bifacially edge-beveled. The hunting tools have use-wear, breakage and post-depositional breakage. From 400-500 cal BP 75% (3) of the tools have use-wear, 25% (1) are broken from use and 50% (2) are broken after deposition.

Table 6.12 Hunting Tools Total Count. The analyzed categories of hunting tools by corresponding occupation range.

Hunting Tools					
	Modern-400	400-500	450-550	550-600	600
Raw Material					
Slate		4			
Color					
Black		3			
Light Grey		1			
Yup'ik Characteristics					
Ulukaq		2			
Kukupat		2			
Collection Location					
Tuyuryaq Area		2			
Security Cove		2			
Production					
Snapped		1			
Chipped		2			
Polished		2			
Surface Grinding		2			
Hafting		1			
Edge Beveling-Bifacial		2			
Discard					
Use-Wear		3			
Breakage-Use		1			
Breakage-Post-Depositional		2			

6.2.6 Uluaq [Ulu]

The total count of *uluaq* [ulu] analysis is in Table 6.11. All the *uluaq* [ulus] are constructed from slate. There are three slate *uluaq* from 400-500 cal BP, three slate *uluaq* from 550-600 cal BP and one slate *uluaq* from 600 cal BP. The color from all the *uluaq* are black. From 400-500BP 100% (3) of the *uluaq* are black, from 55-600 cal BP 100% (3) are black and from 600 cal BP 100% (3) are black. All the *uluaq* Yup'ik characteristics are *ulukaq* [dark slate]. From 400-500BP 100% (3) are *uluakaq* [dark slate], from 55-600 cal BP 100% (3) are *ulukaq* [dark slate], and from 600 cal BP 100% (3) are *ulukaq* [dark slate]. All the *uluaq* are relatively sourced to the *Tuyuryaq* area. From 400-500BP 100% (3) of the *uluaq* are from the *Tuyuryaq* area, from 550-600 cal BP 100% (3) are from the *Tuyuryaq* area and from 600 cal BP 100% (3) are from the *Tuyuryaq* area.

The *uluaq* are chipped, polished, ground, hafted, and bifacially beveled. From 400-500 cal BP 66% (2) of the *uluaq* are chipped, 66% (2) are polished, 100% (3) are ground, 33% (1) are hafted and 100% (3) are bifacially beveled. From 550-600 cal BP 66% (2) of the *uluaq* are chipped, 100% (3) are polished, 100% (3) are ground and 100% (3) are bifacially beveled. From 600 cal BP 100% (1) are chipped, 100% (1) are polished, 100 % (1) are ground and 100% (1) are bifacially beveled. The *uluaq* have use-wear, breakage from use-wear and post-depositional breakage. From 400-500 cal BP 100% (3) of the uluaq are use-worn, 33% (1) are broken from use-wear and 66% (2) are broken post deposition. From 550-600 cal BP 100% (3) of the uluaq were use-worn, and 100% (3) are broken from use-wear. From 600 cal BP 100% (1) are use-worn and were broken from use.

Table 6.13 *Uluaq* [Ulu] Total Count. The analyzed categories of *uluaq* [ulus] by corresponding occupation range.

Uluaq [Ulu]					
	Modern-400	400-500	450-550	550-600	600
Raw Material					
Slate		3		3	1
Color					
Black		3		3	1
Yup'ik Characteristics					
Ulukaq		3		3	1
Collection Location					
Tuyuryaq Area		3		3	1
Production					
Chipped		2		2	1
Polished		2		3	1
Surface Grinding		3		3	1
Hafting		1			
Edge Beveling-Bifacial		3		3	1
Discard					
Use-Wear		3		3	1
Breakage-Use		1		3	1
Breakage-Post-Depositional		2			

6.3 Culturally Modified Faunal Organics

All the faunal remains collected and retained from the excavation are tools (Kowta 1960, 1963). Table 6.12 illustrates the reanalyzed culturally modified faunal typologies. There were tool kits used for hunting land and sea mammals, fishing and fowling, plant collection, hide processing, clothing production and wartime ventures.

Table 6.14 Culturally Modified Faunal Organic Technology. The culturally modified faunal organic technology by corresponding occupation range.

Culturally Modified Faunal Organics					
	Modern-400	400-500	450-550	550-600	600
Scraper/Wedge	3	12		1	
Slat Armor	1	3	1		
Caniryak [Arrow Foreshaft]	1	2			
Pointed Tool/Root Digger	1	1			
Taluutaq [Grass Comb Piece]	1				
Mingqun [Needle]	2				
Evga [Harpoon Socket]	1	2			
Bucket Handle	1	1		3	
Caniisaq [Knife Handle]		1		1	
Scraper Handle		3	1	1	
Teguyaraq [Handle]		1			
Everqunn [Awl]		7		1	1
Aklegaq [Seal Dart Head]		1			
Iqsak [Fish Hook]		1			
Arulan [Bow Drill]		1			
Cikuliurun [Ice Pick]		1			
Panaq [Lance]		1			
Cingilek [Arrow Point]		2		2	
Akitnaq [Flat Point Bird Dart]		1			
Asaaquq [Toggling Harpoon]		2			
Dart		1			
Spear Prongs	1	1			
Nalayarrsuun [Salmon Harpoon]		1			
Salmon Spear Prongs		1			
Fish Spear pongs				1	
Kelipacuutaq [Fish Scaler]					1
Kicaqutaq [Bone Sinker]					1
Soft Hammerstone					1

Of the culturally modified faunal organics all the identified tools are produced from *tuntu* [caribou (*Rangifer tarandus*)] and *asveq* [walrus (*Odobenus rosmarus*)], as well as, some unidentifiable remains. Table 6.13 illustrates the total count of the analyzed culturally modified faunal organics, while Table 6.14 illustrates the mean percentage and significance of the analyzed materials from before and after/during the little ice age. Over half of the collection is constructed from *tuntu* [caribou (*Rangifer tarandus*)] antler and bones, while less than half are

constructed from *asveq* [walrus (*Odobenus rosmarus*)]. *Asveq* [walrus (*Odobenus rosmarus*)] is the only species with a mean significantly less during/after the Little Ice Age than before.

The culturally modified faunal organics made from *tuntu* [caribou (*Rangifer tarandus*)] were hunted along the bay from *Tuyuryaq* to *Arviiq* [Platinum] and *Mamterat* [Goodnews Bay]. *Tuntu* were also hunted along the Togiak River and surrounding valleys. The second most abundant identifiable remain is *asveq* [walrus (*Odobenus rosmarus*)], which was hunted around the bay and on the surrounding islands. Of the hunting locations, only the bays and surrounding islands have means significantly less during/after the Little Ice Age than before.

The bone type (bone, antler, ivory) and elements primarily consist of antler remains including the beam, tines and forks. Bone tools closely follow including the ulna, tibia, tuok socket, scapula and ribs. Ivory is less abundant. Antler has a mean significantly more during/after the Little Ice Age than before, while the beams and ribs have means significantly less during/after the Little Ice Age than before.

Culturally modified faunal organic burn codes were assessed to explore production and/or reuse of fauna. The faunal organics are primarily unburnt, while some are burned black or brown/black. Of the fauna, none of burned remains have means significantly different from after to before the Little Ice Age. Weathering was then analyzed to assess the amount of post-depositional damage to the culturally modified fauna dependent upon the amount of time exposed above the surface. The faunal organics are primarily weathering stages 0-3, while only one remain is weathering stage 4. Of the fauna weathering stages, stage 1 has a significantly higher mean during/after the Little Ice Age than before, while stage 4 has a mean significantly less during/after the Little Ice Age than before

The production of culturally modified faunal organics were visually assessed for chipping, polishing, grinding and drilling. All the production methods are consistent throughout the occupation, spiking in 400-500 cal BP. None of the production techniques are significantly different from during/after the Little Ice Age to before the Little Ice Age.

Use-wear and use breaks were analyzed to assess discard patterns. More than 50% of the tools have signs of use-wear and demonstrate signs of breakage from use. Neither the use-wear nor use-wear breaks have means significantly different from during/after the Little Ice Age to before the Little Ice Age.

Each season is equally represented in the faunal assemblage because many of the tools are used in all seasons. None of the seasons of tool use are significantly different from during/after the Little Ice Age to before the Little Ice Age. The dual, male and female tool use are consistently similar except for in 600BP, which has only dual or female tools. None of the gender use has means significantly different from during/after the Little Ice Age to before the Little Ice Age.

Table 6.15 Culturally Modified Faunal Organics Total Count. The total count of culturally modified faunal organics by corresponding occupation range. Continues to next page.

Culturally Modified Faunal Organics Total Count					
	Modern-400	400-500	450-550	550-600	600
Species					
Tuntu [Caribou]	12	48	2	6	2
Asveq [Walrus]	1	11	2	4	1
Unidentifiable	6	20	1	2	1
Hunting Locations					
Tuyuryaq To *Mamterat* [Goodnews Bay]	12	48	2	6	2
Togiak River and Valleys	12	48	2	6	2
Bay and Surrounding Islands	1	11	2	4	1
Elements					
Antler	10	51	2	6	1
Bone	8	16	2	3	2
Ivory	1	3		1	1
Unidentifiable		9	1	5	
Beam	5	28		1	
Ulna	1	1			
Pedicle/Beam	1	3	2	1	
Tibia	1				
Tusk	1	3		1	
Tine	2	4		1	
Fork		1			
Beam/Tine		2			
Long Bone		2			1
Tuok Socket		1			
Scapula		1			1
Rib		2		3	
Burning					
Unburnt	19	52	3	11	3
Burn-Black	1	19	2	3	1
Burn-Brown/Black		10			
Weathering					
Weathering-0	1	22	2	6	1
Weathering-1	6	37		3	2
Weathering-2	9	11	1		
Weathering-3	4	2	1	2	1
Weathering-4				1	
Weathering-5					

Table 6.16 Culturally Modified Faunal Organics Total Count Continued. The total count of culturally modified faunal organics by corresponding occupation range.

Culturally Modified Faunal Organics Total Count					
	Modern-400	400-500	450-550	550-600	600
Production					
Cutting	13	36	2	6	2
Polishing	5	34	1	8	2
Grinding	10	44	2	8	2
Chipping	6	34	1	5	2
Drilling	2	22	1	6	1
Discard					
Use-Wear	50	56		57	75
Use-Breaks	35	33	20	29	50
Season of Use					
Spring	12	46	2	8	3
Summer	11	39	2	7	2
Fall	11	46	2	8	2
Winter	11	42	2	8	3
Gender Use					
Dual	4	19		7	1
Female	3	15	1	2	3
Male	3	14	1	2	
Child					
Child's Toy	3				

Table 6.17 Culturally Modified Faunal Organics Mann-Whitney U. The mean percentage of the culturally modified fauna from during/after to before the Little Ice Age. The Mann-Whitney U, Z test and assumed two-tailed significance. Significant tests are highlighted.

Culturally Modified Faunal Organics Mann-Whitney U				
	Mean During/After The Little Ice Age	Mean Before The Little Ice Age	Z	Sig. (2-tailed)
Species				
Tuntu [Caribou]	61	43	-1.490	0.136
Asveq [Walrus]	12	30	-2.173	0.030
Hunting Locations				
Tuyuryaq To *Mamterat* [Goodnews Bay]	61	43	-1.490	0.136
Togiak River and Valleys	61	43	-1.490	0.136
Bay and Surrounding Islands	12	30	-2.173	0.030
Elements				
Antler	62	39	-1.956	0.05
Bone	24	30	-.612	0.541
Ivory	4	4	-.067	0.947
Beam	33	9	-2.344	0.019
Ulna	2	0	-6.84	0.494
Pedicle/Beam	4	13	-1.666	0.096
Tibia	1	0	-.482	0.633
Tusk	4	4	-.067	0.947
Tine	6	4	-.317	0.751
Fork	1	0	-.482	0.630
Beam/Tine	2	0	-.684	0.494
Long Bone	2	4	-.647	0.518
Tuok Socket	1	0	-.482	0.630
Scapula	1	4	-1.131	0.258
Rib	2	13	-2.392	0.017
Burning				
UnBurnt	63	52	-.921	0.357
Burn-Black	20	26	-.618	0.536
Burn-Brown/Black	10	0	-1.584	0.113
Weathering				
Weathering-0	23	39	-1.555	0.120
Weathering-1	43	17	-2.302	0.021
Weathering-2	20	4	-1.807	0.071
Weathering-3	7	17	-1.550	0.121
Weathering-4	0	4	-2.075	0.038
Weathering-5	0	0	0	1

Table 6.18 Culturally Modified Faunal Organics Mann-Whitney U Continued. The mean percentage of the culturally modified fauna from during/after to before the Little Ice Age. The Mann-Whitney U, Z test and assumed two-tailed significance. Significant tests are highlighted.

Culturally Modified Faunal Organics Mann-Whitney U				
	Mean During/After The Little Ice Age	Mean Before The Little Ice Age	Z	Sig. (2-tailed)
Cutting	49	43	-.518	0.604
Polishing	39	48	-7.38	0.461
Grinding	55	52	-2.05	0.838
Chipping	40	35	-4.95	0.621
Drilling	24	35	-1.031	0.303
Discard				
Use-Wear	55	48	-.579	0.562
Use-Breaks	33	30	-.914	0.361
Season of Use				
Spring	59	57	-.180	0.857
Summer	51	48	0-.231	0.818
Fall	58	52	-.469	0.639
Winter	54	57	-.258	0.797
Gender Use				
Dual	23	35	-1.141	0.254
Female	19	26	-.735	0.462
Male	18	13	-.558	0.558

6.3.1 Scraper/Wedge

In ethnographic reports and online resources, such as the Smithsonian's Online Alaska Native Collection, wedge-shaped antler tools are both hide processing scrapers and wood working wedges. Thus, I combined the category for the purpose of this analysis. All the scraper/wedges are constructed from *tuntu* [caribou (*Rangifer tarandus*)] antler and are recovered from modern-400 cal BP, 400-500 cal BP and 550-600 cal BP.

From modern-400 cal BP 66% (2) are constructed from the beam of the antler and 33% (1) are constructed from the beam with the pedicle still attached. From 400-500 cal BP 81% (9) of the scraper/wedges are constructed from the beam and 18% (2) from the beam with the pedicle still attached. From 550-600 cal BP 50% (1) of the scraper/wedges are constructed from the beam and 50% (1) are built from the beam with the pedicle attached.

The only material used to produce scraper/wedges are *tuntu* [caribou (*Rangifer tarandus*)] antlers, thus all the materials are hunted or collected from the *Tuyuryaq* to *Arviiq* [Platinum] and *Mamterat* [Goodnews Bay] or along the Togiak River and adjacent valleys. 100% of the materials are from one of these two locations from modern-400 cal BP, 400-500 cal BP and 550-600 cal BP. The scraper/wedges are primarily unburnt. From modern-400 cal BP 100% (3) of the scraper/wedges are unburnt. From 400-500 cal BP 27% (3) of the scraper/wedges are burned black and brown/black, while 54% (6) are unburnt. From 550-600 cal BP 100% (2) are burned black.

The scraper/wedges have signs of chipping, polishing and grinding. From modern-400 cal BP 66% (2) of the scraper/wedges are chipped, 33% (1) are polished and 100% (3) are ground. From 400-500 cal BP 45% (5) are chipped, 73% (8) are polished and 100% (11) are ground. From 550-600 cal BP 100% (2) are chipped, 100% (2) are polished and 100% (2) are ground.

All the scraper/wedges have use-wear. Use-wear includes chipping, cutting and breaking. From modern-400 cal BP 100% (3) are use-worn on the working edge, from 400-500 cal BP 100% (11) tools are use-worn on the working edge and from 550-600 cal BP 100% (2) of the tools were use-worn on the working edge.

Table 6.19 Scraper/Wedge Total Count. The analyzed categories of scraper/wedges by corresponding occupation range.

Scraper/Wedge					
	Modern-400	400-500	450-550	550-600	600
Species					
Tuntu [Caribou]	3	11		2	
Hunting Location					
Tuyuryaq To *Mamterat* [Goodnews Bay]	3	11		2	
Togiak River and Valleys	3	11		2	
Element					
Antler	3	11		2	
Bone					
Ivory					
Beam	2	9		1	
Pedicle/Beam	1	2		1	
Burning					
UnBurnt	3	6			
Burn-Black		3		2	
Burn-Brown/Black		3			
Production					
Cutting	2	5		2	
Polishing	1	8		2	
Grinding	3	10			
Use-Wear Location					
Use-Wear	3	11		2	
Working Edge	3	11		2	

6.3.2 Handles: Uluaq [Ulus] and Knives

Uluaq [ulus] and knife handles include tools with hafting wear or drilled holes for attaching blades. The handles are primarily constructed of *tuntu* [caribou (*Rangifer tarandus*)] while one is *asveq* [walrus (*Odobenus rosmarus*)]. From 400-500 cal BP 80% (4) of the handles are made from *tuntu* [caribou (*Rangifer tarandus*)], while 20% (1) are from *asveq* [walrus (*Odobenus rosmarus*)]. From 450-550 cal BP, 550-600BP and 600 cal BP 100% (1) are constructed from *tuntu* [caribou (*Rangifer tarandus*)].

The raw materials hunted for handles are primarily located in the *Tuyuryaq* area to *Arviiq* [Platinum] and *Mamterat* [Goodnews Bay], as well as, along the Togiak River and adjacent valleys. From 400-500 cal BP 83% (5) of the remains were hunted or collected from the land

between *Tuyuryaq* and Mamterat [Goodnews Bay] and/or along the *Togiak River* and valleys, while 17% (1) of the remains would have been hunted along the local bays and islands. From 450-550 cal BP and 550-600 cal BP 100% (1) of the remains were hunted from *Tuyuryaq* to *Mamterat* [Goodnews Bay] and the Togiak River and adjacent valleys.

The *uluaq* and knife handles are constructed from mostly antler and one ivory element. From 400-500 cal BP 80% (4) of the handles are antler from the beam and tine element and 20% (1) are ivory. From 450-550 cal BP 100% (1) of the handles are constructed from an antler beam with the pedicle attached. From 550-600 cal BP 100% (1) of the handles are constructed from antler tine. From 600 cal BP 100% (1) of the handles are constructed from antler beam. The handles are primarily unburnt, from 400-500 cal BP 60% (3) of the handles are unburnt and 40% (2) of the handles are burned black. At 600 cal BP 100% (1) of the handles are unburnt. From 450-550 cal BP 100% (1) of the handles are burned black and from 550-600 cal BP 100% (1) of the handles are unburnt.

The handles are evenly produced by chipping, polishing and grinding techniques. From 400-500 cal BP 60% (3) of the handles are chipped and polished, while 40% (2) are also ground. From 450-550 cal BP 100% (1) of the handles are ground and from 550-600 cal BP 100% (1) of the handles are chipped, polished and ground. From 600 cal BP 100% (1) of the handles are chipped. From 400-500 cal BP 80% (4) handles are use-worn and from 550-600 and 600 cal BP 100% (1) are use-worn. The location of the use-wear varies, from 400-500 cal BP 60% (3) of the handles have use-wear on their working edge and 20% (1) on the handle attachment. From 550-600 cal BP 100% (1) have use-wear on the proximal and distal ends. At 600 cal BP 100% (1) of the handles have use on the working edge.

Table 6.20 Handles Total Count. The analyzed categories of handles by corresponding occupation range.

Handles						
		Modern-400	400-500	450-550	550-600	600
Species						
	Tuntu [Caribou]		4	1	1	1
	Asveq [Walrus]		1			
Hunting Location						
	Tuyuryaq To *Mamterat* [Goodnews Bay]		5	1	1	
	Togiak River and Valleys		5	1	1	
	Bay and Surround Islands		1			
Element						
	Anlter		4	1	1	
	Bone					
	Ivory		1			
	Beam		3			1
	Pedicle/Beam			1		
	Tusk		1			
	Tine		1		1	
Burning						
	UnBurnt		3		1	1
	Burn-Black		2	1		
Production						
	Chipped		3		1	1
	Cutting		2	1	1	1
	Polished		3		1	
	Grinding		2	1	1	
Use-Wear						
	Use-Wear		4		1	1
	Working Edge		3		1	1
	Handle Attachment		1			
	Proximal and Distal Ends				1	

6.3.3 Clothing Production

Clothing production tools include two *everqunn* [awls] and eight *mingqun* [needles]. From modern-400 cal BP there are two *mingqun* [needles], from 400-500 cal BP there are seven *everqunn* [awls] and from 450-550 cal BP there is one *everqunn* [awl].

The *everqunn* [awls] and *mingqun* [needles] are primarily constructed from *tuntu* [caribou (*Rangifer tarandus*)] and from unknown materials, while two are from *asveq* [walrus (*Odobenus rosmarus*)]. From modern-400 cal BP 50% (1) of the clothing production tools are constructed from *tuntu* [caribou (*Rangifer tarandus*)] and 50% (1) are from an unidentified source. From 400-500 cal BP 67% (4) *everqunn* [awls] and *mingqun* [needles] are constructed from *tuntu* [caribou (*Rangifer tarandus*)], 17% (1) are from *asveq* [walrus (*Odobenus rosmarus*)] and 33 % (2) are unidentifiable. From 550-600 cal BP 100% (1) are constructed from *asveq* [walrus (*Odobenus rosmarus*)].

From modern-400 cal BP 50% (1) and from 400-500 cal BP 67% (4) *everqunn* [awls] and *mingqun* [needles] are hunted from the *Tuyuryaq* area to *Arviiq* [Platinum] and *Mamterat* [Goodnews Bay], as well as, along the Togiak River and adjacent valleys. Then from 400-500 cal BP 17% (1) and from 550-600 cal BP 100% (1) are hunted in the bay and the surrounding valleys.

The *everqunn* [awls] and *mingqun* [needles] are mainly constructed from antler and bone, while one tool is made from ivory. From modern-400 cal BP 50% (1) are made from antler and 50% (1) are made from bone. From 400-500 cal BP 67% (4) are made from antler pedicle with the beam attached and antler tine. From 550-600 100% (1) are made from ivory tusk. While at 600 cal BP 100% (1) are made from bone.

The clothing producing tools are primarily unburnt. From modern-400 cal BP 100% (2), from 400-500 cal BP 71% (5), from 450-550 cal BP 100% (1) and 600 cal BP 100% (1) are unburnt. Only 29% (2) of the *everqunn* [awls] and *mingqun* [needles] are burned black. All the tools are polished and ground to shape, with four also chipped. From modern-400 cal BP 50% (1) of the *everqunn* [awls] and *mingqun* [needles] are polished and 50% (1) are ground. From 400-500 cal BP 57% (4) are chipped, 71% (5) are polished and 86% (6) are ground. From 550-600 cal BP 100% (1) of the *everqunn* [awls] and *mingqun* [needles] are polished and ground and from 600 cal BP 100% (1) are polished and ground.

All, except for one of the tools have signs of use wear. From modern-400 cal BP 50% (1) of the clothing production tools are use-worn along the working edge while 50% (1) are use-worn on the tip. From 400-500 cal BP 29% (2) *everqunn* [awls] and *mingqun* [needles] are use-worn on the working edge, 43% (3) on the tip and 14% (1) on the non-working edge. From 550-600 cal BP 100% (1) of the tools are worn on the proximal and distal ends and at 600 cal BP 100% (1) of the tools are worn along the non-working edge.

Table 6.21 Clothing Production Total Count. The analyzed categories of clothing production by corresponding occupation range.

Clothing Production					
	Modern-400	400-500	450-550	550-600	600
Mingqun [Needle]	2				
Everqunn [Awl]		7		1	1
Species					
Tuntu [Caribou]	1	4			
Asveq [Walrus]		1		1	
Collection Location					
Tuyuryaq To *Mamterat [Mamterat [Goodnews Bay]]*	1	4			
Togiak River and Valleys	1	4			
Bay and Surrounding Islands		1		1	
Element					
Anlter	1	4			
Bone	1	2			1
Ivory				1	
Pedicle/Beam		1			
Tusk				1	
Tine		2			
Burning					
UnBurnt	2	5		1	1
Burn-Black		2			
Production					
Chipping		4			
Polishing	1	5		1	1
Grinding	1	6		1	1
Use-Wear					
Use-Wear	2	6		1	1
Working Edge	1	2			1
Tip	1	3			
Non-Working End		1			1
Proximal and Distal Ends				1	

6.3.4 Land/Sea Mammal Hunting

Large mammal hunting tools include *caniryak* [arrow foreshafts], *evga* [harpoon sockets], *aklegaq* [seal dart heads], *panaq* [lances], *cingilek* [arrow points] and *assaqug* [toggling

harpoons]. From modern-400 cal BP there is one *caniryak* [arrow foreshaft] and one *evga* [harpoon sockets]. From 400-500 cal BP there are two *caniryak* [arrow foreshafts], two *evga* [harpoon sockets], one *aklegaq* [seal dart head], *panaq* [lance], two *cingilek* [arrow points] and one *asaaquq* [toggling harpoon]. From 550-600 cal BP there are *cingilek* [arrow points]. All the species identifiable are constructed from *tuntu* [caribou (*Rangifer tarandus*)] except for one of *asveq* [walrus (*Odobenus rosmarus*)]. From modern-400 cal BP 100% (2) hunting weapons are made from *tuntu* [caribou (*Rangifer tarandus*)], from 400-500 cal BP 44% (4) hunting tools are made from *tuntu* [caribou (*Rangifer tarandus*)] and 11% (1) from *asveq* [walrus (*Odobenus rosmarus*)] and from 550-600 cal BP 50% (1) are produced from *tuntu* [caribou (*Rangifer tarandus*)].

All the raw material is made from *tuntu* [caribou (*Rangifer tarandus*)] except for one *asveq* [walrus (*Odobenus rosmarus*)] remain, thus the material is primarily hunted from *Tuyuryaq* to *Arviiq* [Platinum] and *Mamterat* [Goodnews Bay], as well as, along the Togiak River and adjacent valleys. The one *asveq* [walrus (*Odobenus rosmarus*)] remains was hunted in the bay and surrounding islands.

The hunting tools are primarily made from antler, only three being produced from bone. From modern-400 cal BP 100% (2) of the tools are made from antler, 50% (1) are produced from the tine of an antler. From 400-500 cal BP 55% (5) of the hunting tools are made from antler, 33% (3) from bone, and the rest unidentifiable to element. From 550-600BP 50% (1) of the hunting weapons are made from antler the other 50% unidentifiable. The hunting tools are primarily unburnt. From modern-400 cal BP 100% (2) of the large mammal hunting weapons are unburnt. From 400-500 cal BP 67% (6) of the weapons are unburnt, 11% (1) are burned black and 22% (2) are burned brown/black. From 550-600 cal BP 50% (1) of the weapons are unburnt and 50% (1) are burned black.

The hunting technology is chipped, polished and ground. From modern-400 cal BP 100% (2) of the hunting weapons are chipped, 50% (1) are polished and 100% (2) are ground. From 400-500 cal BP 56% (5) of the hunting tools are chipped, 33% (3) are polished and 87% (8) are ground. From 550-600 cal BP 100% (2) of the tools are chipped, 50% (1) are polished and 100% (2) are gound.

The hunting tools are use-worn. From modern-400 cal BP 100% of the tools are use-worn, 50% (1) on the working edge and 50% (1) on the tip. From 400-500 cal BP 8% (1) of the

tools are worn, 33% (3) on the working edge, 33% (3) on the point and 22% (2) on the non-working edge. From 550-600 cal BP 50% (1) of the tools are use worn on the point of the tool.

The tools are primarily used in the summer and fall. From modern-400 cal BP 50% (1) of the tools are used spring, summer and winter, while 100% (2) of the tools are used in the fall. From 400-500 cal BP 63% (5) of the tools are used in the spring, 88% (7) of the tools are used in the summer, 100% (9) of the tools are used in the fall and 63% (5) are used in the winter. From 550-600 cal BP 100% of the tools are used in the summer and fall.

Table 6.22 Land/Sea Mammal Hunting Tools. The analyzed categories of land/sea mammal by corresponding occupation range.

Land/Sea Mammal Hunting Tools					
	Modern-400	400-500	450-550	550-600	600
Arrow Foreshaft	1	2			
Asaaquq [Toggling Harpoon] Socket	1	2			
Seal Dart Tip		1			
Lance Foreshaft		1			
Arrow Tip		2		2	
Harpoon Tip		1			
Species					
Tuntu [Caribou]	2	5		1	
Asveq [Walrus]		1			
Hunting Location					
Tuyuryaq To *Mamterat* [Goodnews Bay]	2	5		1	
Togiak River and Valleys	2	5		2	
Bay and Surround Islands		1			
Element					
Antler	2	5		1	
Bone		3			
Tine	1				
Burning					
Unburnt	2	6		1	
Burn-Black		1		1	
Burn-Brown/Black		2			
Production					
Chipping	2	5		2	
Polishing	1	3		1	
Grinding	2	8		2	
Use-Wear					
Use-Wear	2	8		1	
Working Edge	1	3			
Point	1	3		1	
Non-Working End		2			
Season of Use					
Spring	1	5			
Summer	1	7		2	
Fall	2	8		2	
Winter	1	5			

6.3.5 Fishing Tools

Fishing tools include prongs, placed on the sides of a fish spear, one *iqsak* [fish hook], one *nalayarrsuun* [salmon harpoon], and one salmon spear prong. The fishing tools are mainly constructed from *tuntu* [caribou (*Rangifer tarandus*)], while two remains are unidentifiable. From modern-400 cal BP 100% (1) of the tools are unidentifiable. From 400-500 cal BP 75% (3) of the tools are *tuntu* [caribou (*Rangifer tarandus*)], while 25% (1) are unidentifiable. From 550-600 cal BP 100% (1) of the tools are *tuntu* [caribou (*Rangifer tarandus*)].

All the identified fishing tools are made of *tuntu* [caribou (*Rangifer tarandus*)], thus are either hunted or collected from the *Tuyuryaq* area to *Arviiq* [Platinum] and *Mamterat* [Goodnews Bay], as well as, along the Togiak River and adjacent valleys. From 400-500 cal BP 75% of the fishing tools raw material are hunted or collected from the *Tuyuryaq* area to *Arviiq* [Platinum] and *Mamterat [Goodnews Bay]* and along the Togiak River and valleys. From 450-550 cal BP 100% (1) of the tools are hunted or collected from the *Tuyuryaq* area to *Arviiq* [Platinum] and *Mamterat [Goodnews Bay]* and along the Togiak River and valleys

Of the *tuntu* [caribou (*Rangifer tarandus*)] tools, four are constructed from antler and two from bone. From modern-400 cal BP 100% (1) of the fishing tools are made from bone, from 400-500 cal BP 75% (3) are made from antler; one from the beam and 25% (1) from bone, and from 550-600 cal BP100% (1) are made from antler. The fishing tools are primarily unburnt, while two are burned black. From modern-400 cal BP 100% (1) of the fishing tools are unburnt, from 400-500 cal BP 50% (2) are unburnt while 50% (2) are burned black and from 550-600 cal BP 100% (1) of the tools are unburnt.

All the tools are ground with some chipping and polishing. From modern-400 cal BP 100% (1) of the fishing tools are ground. From 400-500 cal BP 50% (2) of the tools are chipped and polished while 100% (4) of the tools are ground. From 550-600 cal BP 100% (1) of the fishing tools are chipped, polished and ground. All except one of the fishing tools are use-worn. From modern-400 BP 100% (1) of the tools are use-worn on the tip of the tool. From 400-500 cal BP 75% (3) of the tools are use-worn, 25% (1) on the working 25% (1) on the tip and 25% (1) on the barb. From 550-600 cal BP 100% (1) of the tools are use-worn on the tip.

The fishing tools are primarily used in all seasons, the spears in the summer and fall. From modern-400 cal BP 100% (1) of the tools are used in the spring, summer, fall and winter. From 400-500 cal BP 50% (2) of the tools are used in the spring, 100% (4) in the summer and

fall and 75% (3)are used the winter. From 550-600 cal BP 100% of the tools are used in the spring, summer, fall and winter.

Table 6.23 Fishing Tools Total Count. The analyzed categories of fishing tools by corresponding occupation range.

Fishing Tools					
	Modern-400	400-500	450-550	550-600	600
Hunting Prongs	1	1			
Fish Hook		1			
Salmon Harpoon Head		1			
Salmon Spear Pongs		1			
Fish Spear Prong				1	
Species					
Tuntu		3		1	
Hunting Location					
Tuyuryaq To *Mamterat* [Goodnews Bay]		3	1		
Element					
Antler		3		1	
Bone	1	1			
Beam		1			
Burning					
UnBurnt	1	2		1	
Burn-Black		2			
Production					
Chipping		2		1	
Polishing		2		1	
Grinding	1	4		1	
Use-Wear					
Use-Wear	1	3		1	
Working Edge		1			
Tip	1	2			
Barbs		1			
Season					
Spring	1	2		1	
Summer	1	4		1	
Fall	1	4		1	
Winter	1	3		1	

6.4 Culturally Modified *Murak* [Wood]

The culturally modified *murak* [wood] technology include serving plates, *mur'un* [water dippers], *assipaq* [cutting boards], *alvik* [curved bowls], grass basket bottoms, handles for cutting tools, *inuguat* [family dolls], *avangcaq* [mask] fragments, toy *cukamgegaitaq* [bows], model a*gciun* [paddles], *qipaun* [net shuttles], shaft fragments, *egun* [throwing boards], *kumartessuun* [fire drill boards], *kumarcissuun* [fire drills], pegs and stakes.

Table 6.24 Culturally Modified *Murak* [Wood]. The culturally modified *murak* [wood] by corresponding occupation range.

Culturally Modified *Murak* [Wood] Tools					
	Modern-400	400-500	450-550	550-600	600
Kulupak [Plate]	1				
Qipaun [Net Shuttle]		1	1		
Mask Attachment		1	1	1	
Kumartessuun [Fire Drill Board]		3			
Kumarcissuun [Fire Drill]		2	3	3	
Shaft Fragment		5	12	2	3
Cukamgegaitaq [Bow]		3	1		1
Egun [Throwing Board]		1	1		
Handle			3	2	
Wooden Vessel			1		
Flattened Shaft Fragment				5	
Model Paddle				1	
Grass Basket Bottom				1	
Inuguat [Doll]			2	1	
Toy Bow			1		
Dart Shaft			1		
Wooden Board			1	1	
Knife Handle			1	1	
Assipaq [Cutting Board]			1		
Nuiq [Bird Dart]			3		
Peg			2		
Negcik [Hook] (Fish/Blubber) Handle			1		
Wooden Attachment			1		
Mur'un [Water Dipper] Handle			1		
Arrow Shaft Fragment		1	1		
Alvik [Vessel bottom/ curved bowl]				1	
Stake				1	

Culturally modified *murak* [wood] is primarily constructed with straight grained wood, while wavy grains are the second most abundant. Spiral grains and oblique grains make up a small portion of the collection. Of the culturally modified *murak* [wood], none of the grain types are significantly different from before the Little Ice Age to during/after the Little Ice Age. Grain direction analysis is used to assess the grain properties chosen for certain tools. Longitudinal grain direction is the most prevalent, while oblique and diagonal are less common. Of the culturally modified *murak* [wood], only diagonal grain direction is significantly greater from during/after the Little Ice Age to before. The grain texture of the culturally modified *murak* was assessed as fine texture or coarse texture. Fine textured tools are more abundant than coarse grain texture. Neither of the grain textures are significantly different from during/after the Little Ice Age to before the Little Ice Age.

The culturally modified *murak* [wood] was also analyzed according to five Yup'ik characteristics. *Unarciaq* are straight-grained *murak* from the straight, thick part of a tree. *Avuaralget* are mixed-grain *murak* [wood] with more than one grain type and grain direction such as wavy or oblique. *Akqurrilnqug* are *murak* [wood] without knots—normally straight-grained. *Akqut* are *murak* [wood] with knots—a type of mixed grain wood that had wavy or diagonal grains, indicating knots. *Equgcilria* are a type of mixed grain *murak* [wood], which is smooth and twisted slightly naturally. The most abundant *murak* [wood] characteristic in the collection is *unarciaq* [straight-grained] and *akqurrillnqug* [without knots] followed by *avuaralget* [mixed-grain], *akqut* [with knots] and then *equgciliria* [mixed-grain]. Of the Yup'ik characteristics none are significantly different from during/after the Little Ice Age to before the Little Ice Age.

The identification of conifers (softwood) and angiosperms (hardwood) aided in assessing the origin location of the *murak* [wood]. *Tep'at* [driftwood] came to the *Tuyuryaq* area from the Kuskokwim-Yukon Rivers, along the Togiak River and from southeastern Alaska. The coniferous *tep'at* [driftwood] drifted to the area from the Yukon-Kuskokwim or the southeast whereas the angiosperms were from the Togiak River area. The number of angiosperms and conifers in the collection are nearly even with some unidentifiable remains. There are more angiosperm trees identified during the later occupations than from 450-550 cal BP to 600BP. Coniferous trees have a mean significantly less before the Little Ice Age than during/after the Little Ice Age

The collection location of *murak* [wood] is consistent throughout the occupation until 400 BP when less wood is collected overall, indicating that *tep'at* [driftwood] was consistently located in all the collection locations for 200 years leading to 400BP. Of the *murak* [wood] collection locations the *murak* coming from the Yukon-Kuskokwim River and Islands have a mean significantly more from during/after the Little Ice Age than before the Little Ice Age.

Use-wear includes cutting, chipping, and breakage. Nearly 50% of the collection have signs of use-wear. However, the tools primarily are fragments with no use-wear. The use-wear on the *murak* [wood] is not significantly different from during/after the Little Ice Age to before the Little Ice Age. The seasonal use of culturally modified *murak* [wood] is evenly distributed throughout all the seasons and across the total occupation. Many of the tools are used year-round. However, tools used in the summer and fall are located significantly less during/after the Little Ice Age than before the Little Ice Age. The culturally modified *murak* [wood] is also primarily associated to both male and female tasks. From modern-400 cal BP all of the tools are women's tools dropping then to zero women's tools from 400-500 cal BP, whereas then there is an increase in male associated tools. None of the tool use associated with specific gender are significantly different from during/after the Little Ice Age to before the Little Ice Age. There are a total of ten children's tools or toys in the culturally modified *murak* [wood] collection. The toys include *inuguat* [family dolls] and child bows and arrows. The number of children's tools are not significantly different from during/after the Little Ice Age to before the Little Ice Age.

Table 6.25 Culturally Modified *Murak* [Wood] Total Count. The total count of culturally modified *murak* [wood] by corresponding occupation range. Continues on next page.

Culturally Modified *Murak* [Wood]					
	Modern-400	400-500	450-550	550-600	600
Grain Type					
Straight Grain	1	19	43	12	5
Spiral Grain		2	2	1	
Wavy Grain		8	13	4	
Oblique Grain		1	3		
Grain Direction					
Longitudinal Grain Direction	1	23	51	15	5
Diagonal Grain Direction		2			
Oblique Grain Direction		2	7	1	
Grain Texture					
Coarse Texture	1	6	20	7	2
Fine Texture		21	34	8	3
Yup'ik Characteristics					
Unarciaq	1	18	35	10	5
Avuaralget		9	18	5	
Akqurrilnqug	1	21	40	12	5
Akqut		5	11	3	
Equgcilria		3	5	1	
Wood Type					
Coniferous		17	25	5	3
Angiosperm		9	26	9	2
Unidentifiable	1	5	1		
Collection Location					
Yukon-Kuskokwim Driftwood/Islands		17	25	5	3
Togiak River /*Tuyuryaq* Area Driftwood		9	26	9	2
Use-Wear					
Use-Wear		15	21	7	3
Season of Use					
Spring	1	9	21	9	2
Summer	1	8	24	10	3
Fall	1	8	21	10	2
Winter	1	6	15	9	1

Table 6.26 Culturally Modified *Murak* [Wood] Total Count Continued. The total count of culturally modified *murak* [wood] by corresponding occupation range.

Culturally Modified *Murak* [Wood]					
	Modern-400	400-500	450-550	550-600	600
Dual		6	13	3	1
Female	1		7	4	1
Male		5	4	1	1
Age					
Child		2	5	2	1

Table 6.27 Culturally Modified *Murak* [Wood] Mann-Whitney U. The mean percentages of the culturally modified *murak* [wood] from during/after the Little Ice Age and before the Little Ice Age, as well as, the Mann-Whitney U, Z test and assumed two-tailed significance. All significant tests are in bold and highlighted. Continues on next page.

Culturally Modified *Murak* [Wood] Mann-Whitney U					
		Mean During/ After The Little Ice Age	Mean Before The Little Ice Age	Z	Sig. (2-tailed)
Grain Type					
	Straight Grain	77	78	-.105	0.916
	Spiral Grain	8	4	-.775	0.438
	Wavy Grain	23	25	-.164	0.870
	Oblique Grain	4	4	-.011	0.991
Grain Direction					
	Longitudinal Grain Direction	85	92	-1.670	0.095
	Diagonal Grain Direction	8	0	-2.446	**0.014**
	Oblique Grain Direction	8	10	-.400	0.689
Grain Texture					
	Coarse Texture	23	39	-1.462	0.144
	Fine Texture	77	60	-1.571	0.116
Yup'ik Characteristics					
	Unarciaq	65	65	-.041	0.967
	Avuaralget	35	32	-.200	0.841
	Akqurrilnqug	77	74	-.293	0.770
	Akqut	19	21	-.169	0.866
	Equgcilria	12	8	-.582	0.561
Wood Type					
	Conifer	65	43	-1.978	**0.048**
	Angiosperm	31	49	-1.640	0.101
Collection Locations					
	Yukon-Kuskokwim Driftwood/Islands	69	47	-1.975	**0.048**
	Togiak River/*Tuyuryaq* Area Driftwood	27	47	-1.764	0.078

Table 6.28 Culturally Modified *Murak* [Wood] Mann-Whitney U Continued. The mean percentages of the culturally modified *murak* [wood] from during/after the Little Ice Age and before the Little Ice Age, as well as, the Mann-Whitney U, Z test and assumed two-tailed significance. All significant tests are in bold and highlighted.

Culturally Modified *Murak* [Wood] Mann-Whitney U					
		Mean During/ After The Little Ice Age	Mean Before The Little Ice Age	Z	Sig. (2-tailed)
Use-Wear					
	Use-Wear	50	43	-.630	0.528
Seasons					
	Spring	19	30	-1.049	0.294
	Summer	12	38	-2.477	**0.013**
	Fall	12	32	-2.064	**0.039**
	Winter	8	21	-1.512	0.131
Gender					
	Dual	23	23	-.031	0.975
	Female	4	16	-1.551	0.121
	Male	15	9	-.894	0.371
Age					
	Child	8	10	-.400	0.689

6.4.1 Shafts

The most abundant of the culturally modified *murak* [wood] are shaft fragments. The total count of shaft fragments is in figure 6.25. From 400-500 cal BP 57% (4) are *unarciaq* [straight-grained], 43% (3) are *avuaralget* [mixed-grain] 71% (5) are *akqurrilnqug* [without knots], and 29% (2) are *akqut* [with knots]. From 450-550 cal BP 81% (13) are *unarciaq* [straight-grained], 19% (3) are *avuaralget* [mixed-grained], 81% (13) are *akqurrilnqug* [without knots], 19% (3) are *akqut* [with knots] and 19% (3) are *equgcilria* [soft wood that bends slightly]. From 550-600 cal BP 66% (2) are *unarciaq* [straight-grained] 33% (1) are *avuaralget* [mixed-grained] and 100% (3) are *akqurrilnqug* [without knots]. At 600 cal BP 100% (2) are *unarciaq* [straight grained] and *akqurrilnqug* [without knots]. The shaft fragments are primarily composed of *unarciaq* [straight-grained wood] and akqurrilnqug [wood without knots]. Although there are cases of a shaft fragment being from *avuralget* [mixed-grain wood], *akqut* [wood with knots] and even *equgciliria* [soft wood that bends slightly].

The shaft fragments are evenly dispersed between Yukon-Kuskokwim *tep'at* [driftwood]/islands and Togiak River and local beaches. From 400-500 cal BP 86% (5) of the shaft fragments are from the Yukon-Kuskokwim Rivers/Islands, while 14% (1) are from Togiak River and local beaches. From 450-550 cal BP 56% (9) of the shaft fragments are from the Yukon-Kuskokwim/islands, while 44% (7) are from the Togiak River and local beaches. From 550-600 cal BP 33% (1) of the shaft fragments are from the Yukon-Kuskokwim Rivers and islands, while 66% are from the Togiak River and local beaches. At 600 cal BP 100% (2) of the shaft fragments are from the Yukon-Kuskokwim River and islands.

Over half of the shafts have signs of use-wear, the majority broken from use. From 400-500 cal BP 71% (5) of the shafts are use-worn, from 450-550 50% (8) of the shafts are use-worn, from 550-600 cal BP 66% (2) are worn and at 600 cal BP 100% (2) of the tools are worn.

Some of the shaft fragments are identifiable to specific tool such as *caniryak* [arrow shaft], *nuiq* [bird dart] and *nagiiquyaq* [seal-hunting dart]. From 400-500 cal BP 14% (1) of the shafts are used in the spring, summer and fall. From 450-550 cal BP 2 % (4) of the shafts are used in the spring and summer. From 550-600 cal BP 33% (1) of the shafts are used in the spring, summer and fall seasons.

Table 6.29 Shaft Fragments Total Count. The analyzed categories of shaft fragments by corresponding occupation range.

Shafts					
	Modern-400	400-500	450-550	550-600	600
Yup'ik Characteristics					
Unarciaq		4	13	2	2
Avuaralget		3	3	1	
Akqurrilnqug		5	13	3	2
Akqut		2	3		
Equgcilria			3		
Collection Location					
Yukon-Kuskokwim River Driftwood/Islands		5	9	1	2
Togiak River/*Tuyuryaq* Area Driftwood		1	7	2	
Use-Wear					
Use-Wear		5	8	2	2
Season of Use					
Spring		1	4	1	
Summer		1	4	1	
Fall		1		1	
Winter					

6.4.2 Egun [Throwing Boards]

There were two *egun* [throwing boards] analyzed. From 400-500 cal BP 100% of the *egun* [throwing boards] are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots]. From 450-550 cal BP 100% of the *egun* [throwing boards] are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots]. From 400-500 cal BP 100% (1) of the *egun* [throwing boards] from the Yukon-Kuskokwim River and islands and from 450-550 cal BP 100% (1) of the *egun* [throwing boards] are from the Yukon-Kuskokwim River and islands. Only the *egun* [throwing boards] from 450-550 cal BP is use worn although both of the throwing boards are broken.

Table 6.30 *Egun* [Throwing Boards] Total Count. The analyzed categories of *egun* [throwing boards] by corresponding occupation range.

	***Egun* [Throwing Board]**				
	Modern-400	400-500	450-550	550-600	600
Yup'ik Characteristics					
Unarciaq		1	1		
Avuaralget					
Akqurrilnqug		1	1		
Akqut					
Equgcilria		1			
Collection Location					
Yukon-Kuskokwim River Driftwood/Islands		1	1		
Togiak River/*Tuyuryaq* Area Driftwood					
Use-Wear					
Use-Wear			1		

6.4.3 Cukangegautaq [Bows]

There are six *cukangegautaq* [bows] including two children's toys. From 400-500 cal BP 33% (1) are *unarciaq* [straight-grained] 450-550 cal BP 66% (2) are *avuralget* [mixed-grained], 33% (1) are *akqurrilnqug* [without knots], 33% (1) are *akqut* [with knots] and 33% (1) are *equgcilria* [soft wood good for bending]. From 450-550 cal BP 50% (1) are *unarciaq* [straight-grained], 50% are *avuralget* [mixed-grained], 50% (1) are *akqurrilnqug* [without knots] 50% (1) are *akqut* [with knots] and 50% (1) are *equgcilria* [soft wood good for bending]. At 600 cal BP 100% (1) of the *cukangegautaq* [bows] are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots]. Of the three *cukangegautaq* [bows] from 400-500 cal BP one is *unarciaq* [straight grained] and *akqurrilnqug* [without knots] while the other two are *avuaralget* [mixed-grained] and a mixture of *akqut* [with knots] and *equgcilria* [soft wood good for bending].

From 400-500 cal BP 33% (1) of the *cukangegautaq* [bows] is from the Yukon-Kuskokwim/islands, while 66% (2) of the *cukangegautaq* are from the Togiak River and local beaches. From 450-550 cal BP 50% (1) of the *cukangegautaq* [bows] are from the Yukon-Kuskokwim Rivers and islands, while 50% (1) are from the Togiak River and local beaches. At 600 cal BP 100% (1) of the *cukangegautaq* [bows] are from the Togiak River and local beaches.

All of the *cukangegautaq* [bows], except for one, are use worn. From 400-500 cal BP 100% (3) are use worn, from 450-550 cal BP 50% (1) are use worn and at 600 cal BP 100% (1) are use worn. All the *cukangegautaq* [bows] are fragmented.

Table 6.31 *Cukangegautaq* [Bows] Total Count. The analyzed categories of *cukangegautaq* [bows] by corresponding occupation range.

Cukangegautaq [Bows]					
	Modern-400	400-500	450-550	550-600	600
Yup'ik Characteristics					
Unarciaq		1	1		1
Avuaralget		2	1		
Akqurrilnqug		1	1		1
Akqut		1	1		
Equgcilria		1	1		
Collection Location					
Yukon-Kuskokwim River Driftwood/Islands		1	1		
Togiak River/*Tuyuryaq* Area Driftwood		2	1		1
Use-Wear					
Use-Wear		3	1		1

6.4.4 Handles

The handles include *caviggaak* [men's knife] handles, *uluaq* [ulu] handles and serving utensil handles. From 450-550BP 25% (1) of the handles are *unmircita* [straight-grained], 75% (3) are *avuaralget* [mixed-grains] and 100% (4) are *akqurrilnqug* [without knots]. From 550-600 cal BP 66% (2) of the handles are *unarciaq* [straight-grained], 33% (1) are *avuaralget* [mixed-grained] and 100% are *akqurrilnqug* [without knots].

From 450-550 cal BP 50% (2) of the handles are from the Yukon-Kuskokwim River and islands, while 25% (1) are from the Togiak River and local beaches. From 550-600 cal BP 33% (1) of the handles are from the Yukon-Kuskokwim River and islands, while 66 % (2) are from the Togiak River and local beaches.

Many of the handles are use worn from mounting to the blade. From 450-550 cal BP 100% (4) and from 550-600 cal BP 66% (2) of the handles are use worn.

Table 6.32 Handles Total Count. The analyzed categories of handles by corresponding occupation range.

Handles					
	Modern-400	400-500	450-550	550-600	600
Yup'ik Characteristics					
Unarciaq			1	2	
Avuaralget			3	1	
Akqurrilnqug			4	3	
Akqut					
Equgcilria					
Collection Location					
Yukon-Kuskokwim River, Driftwood/Islands		2	1		
Togiak River/*Tuyuryaq* Area Driftwood			1	2	
Use-Wear					
Use-Wear			4	2	

6.4.5 Fire Equipment

There are a total of ten *kumartessuun* [fire drill boards] and *kumarcissuun* [fire drills] found in the collection. From 400-500 cal BP 100% (5) of the fire-starting materials are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots]. From 450-550 cal BP 66% (2) of the fire starters are *unarciaq* [straight-grained] 33% (1) are *avuaralget* [mixed-grained], 33% (1) are *akqurrilnqug* [without knots], 33% (1) are *akqut* [with knots] and 33% (1) are *equgcilria* [soft wood easy to bend]. From 550-600 cal BP 5% (1) are *unarciaq* [straight-grained] 50% (1) are *avuaralget* [mixed-grained] 50% (1) are *akqurrilnguq* [without knots] and 50% (1) are *akqut* [with knots]. At 600 cal BP 100% (1) are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots].

From 400-500 cal BP 40% (2) of the fire-making equipment is from the Yukon-Kuskokwim Rivers and islands, while 40% (2) are from the Togiak River and local beaches. From 450-550 cal BP 66% (2) of the fire equipment is from the Yukon-Kuskokwim Rivers and islands, while 33% (1) are from the Togiak River and local beaches. From 550-600 cal BP 50% (1) of the fire equipment are from the Yukon-Kuskokwim Rivers and islands, while 50% (1) are from the Togiak River and local beaches. At 600 cal BP 100% (1) are coniferous. Both collection locations are utilized to make *kumartessuun* [fire drill boards] and *kumarcissuun* [fire drills], the majority of the analyzed material collected from Yukon-Kuskokwim Rivers and southeastern

Alaska *tep'at* [driftwood]. All the fire equipment is use worn. The *kumartessuun* [fire drill boards] had drilled holes where the *kumarcissuun* [fire drill], was twirled into the board and on the *kumarcissuun* [fire drill] there was wear and burning on the tip.

Table 6.33 Fire Equipment Total Count. The analyzed categories of fire-making equipment by corresponding occupation range.

Fire Equipment					
	Modern-400	400-500	450-550	550-600	600
Yup'ik Characteristics					
Unarciaq		5	2	1	1
Avuaralget			1	1	
Akqurrilnqug		5	1	1	1
Akqut			1	1	
Equgcilria			1		
Collection Location					
Yukon-Kuskokwim River Driftwood/Islands		2	2	1	1
Togiak River/*Tuyuryaq* Area Driftwood		2	1	1	
Use-Wear					
Use-Wear		3	3	2	

6.4.6 Flat Boards

Two types of flat boards were identified in the collection including basket bottoms and *assipaq* [cutting boards]. From modern-400 cal BP 100% (1) of the boards are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots]. From 450-550 cal BP 33% (1) of the boards were *unarciaq* [straight-grained] and *akqurrilnqug* [without knots], while 66% were *avuarelget* [mixed-grains] and *akqut* [with knots]. From 550-600 cal BP 100% (1) of the boards are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots]. The boards are primarily from straight-grained wood without knots; however, two of the boards were mixed grain wood with knots.

Of the flat boards identifiable to location, from 450-500 BP 100% (3) of the boards are from the Togiak River and local beaches, while from 550-600 cal BP 100% (1) of the boards are from the Yukon-Kuskokwim Rivers and islands. The only bottoms with signs of use-wear are the *assipaq* [cutting boards]. From modern-400 cal BP 100% (1) and from 450-550 cal BP 33% (1) of the *assipaq* [cutting boards] are use worn.

Table 6.34 Flat Boards Total Count. The analyzed categories of flat boards by corresponding occupation range.

Flat Boards					
	Modern-400	400-500	450-550	550-600	600
Yup'ik Characteristics					
Unarciaq	1		1	1	
Avuaralget			2		
Akqurrilnqug	1		1	1	
Akqut			2		
Equgcilria					
Collection Location					
Yukon-Kuskokwim River Driftwood/Islands				1	
Togiak River/*Tuyuryaq* Area Driftwood			3		
Use-Wear					
Use-Wear	**1**		1		

6.4.7 Inuguat [Family Dolls]

Three *inuguat* [family dolls] were identified in the collection. *Inuguat* [family dolls] are girl's toys, used to learn the procedures for sewing clothing. Ethnographic sources indicate that frowning *inuguat* [family dolls] are girls, while smiling *inuguat* [family dolls] are boys (Fienup-Riordan 2007). Two of the *inuguat* [family dolls] from the *Temyiq Tuyuryaq* collection have frowning faces, while one doesn't have a face. From 450-550 cal BP 50% (1) of the *inuguat* [family dolls] are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots] and from 550-600 cal BP 100% (1) of the *inuguat* [family dolls] are *unarciaq* [straight-grained] and *akqurrilnqug* [without knots].

All of the *inuguat* [family dolls] are constructed from materials collected along the Togiak River and local beaches. From 450-550 cal BP and from 550-600 cal BP 100% of the collection are from the Togiak River and local beaches. None of the *inuguat* [family dolls] are use-worn.

Table 6.35 *Inuguat* [Family Dolls] Total Count. The analyzed categories of *inuguat* [family dolls] by corresponding occupation range.

***Inuguat* [Family Dolls]**						
		Modern-400	400-500	450-550	550-600	600
Yup'ik Characteristics						
	Unarciaq			1	1	
	Avuaralget					
	Akqurrilnqug			1	1	
	Akqut					
	Equgcilria					
Collection Locations						
	Yukon-Kuskokwim River Driftwood/Islands					
	Togiak River/*Tuyuryaq* Area Driftwood			2	1	

6.5 Pottery

The pottery temper is primarily constructed of pebbles and a mixture of pebbles and grass. Pebble temper is increasingly used in the later occupations. Pebbles and grass temper are used less during the later occupations. Pebbles and shell are the next abundantly used and stay consistent throughout all occupations. Pebbles-sand and pebbles-shell-sand are less abundant. Of the pottery temper, pebbles and pebbles-shell-grass are significantly different from during/after the Little Ice Age to before the Little Ice Age.

The matrix size of the pottery evaluated how large the temper matrix. The three sizes evaluated were >.5 cm, .5 cm – 1 cm and <1cm. The pottery is primarily >.5 cm, while some sherds have a matrix from .5-1 cm. The pottery matrix size is not significantly different from during/after the Little Ice Age to before the Little Ice Age.

The pottery is primarily black/grey and black/brown, consistently throughout the occupation. Black, grey and brown/grey are less common. Of the pottery colors, black/grey and black/brown are significantly different from during/after the Little Ice Age to before the Little Ice Age.

The pottery collection is burned through cooking or discard processes. Over 50% of the pottery is burned. None of the means are significantly different from during/after the Little Ice Age to before the Little Ice Age. The fragment most often recovered is of the rim, followed by

the side and base. None of the pottery fragment area's means are significantly different from during/after the Little Ice Age to before the Little Ice Age.

The designs are primarily bulges under the rim or a bulging rim. The other designs are sporadic and located once or twice in the same occupation range. Of the pottery designs, the bulging rim is the only symbol to have a significantly different mean from during/after the Little Ice Age to before the Little Ice Age.

Some of the pottery contains an extra outer layer constructed from a light brown clay and woven grass. This phenomenon is associated with the earlier occupation and found rarely in the later occupation. The mean of the outer clay layer is significantly less during/after the Little Ice Age than before the Little Ice Age.

Table 6.36 Pottery Total Count. The total count of pottery by corresponding occupation range.

Pottery					
	Modern-400	400-500	450-550	550-600	600
Temper					
Pebbles	15	21	9	4	1
Pebbles-Grass	9	6	10	6	4
Pebbles-Sand	1	1	3		
Pebbles-Shell		9	3	3	
Pebbles-Shell-Grass		3	6	5	
Sand-Grass		2			
Grass		1			
Matrix Size					
<.5cm	6	9	3	3	
.5-1cm	19	34	28	17	5
>1cm					
Color					
Black	1	9	2	3	
Grey	2				
Black-Grey	16	13	5	4	
Black-Brown	4	20	23	13	5
Brown-Grey	2	1	1		
Burning					
Burned	21	35	29	18	5
Unburnt	4	8	2	2	
Fragment					
Rim	7	11	11	9	
Side	2	3	3	1	2
Base		6		1	
Design					
Single Line Under Rim			3		
Two parallel Lines Under Rim	8				
Three Parallel Lines Under Rim	4				
Bulge Under Rim	4	7	13	10	
Rim is Bulged	4	2	16	30	
The Oblique Lines Under Rim	4				
Two bulges Under Rim		5			
Single Dot Under Rim			3	5	
Indent Under Rim				5	
Outer-Clay Layer					
Outer Clay	3	4	13	8	4

Table 6.37 Pottery Mann-Whitney U. The mean percentages of the pottery from during/after the Little Ice Age and before the Little Ice Age, as well as, the Mann-Whitney U, Z test and assumed two-tailed significance. All significant tests are in bold and highlighted. Continues on next page.

Pottery Mann-Whitney U				
	Mean During/After The Little Ice Age	Mean Before The Little Ice Age	Z	Sig. (2-tailed)
Temper				
Pebbles	53	25	-3.144	**0.002**
Pebbles-Grass	22	36	-1.647	0.094
Pebbles-Sand	3	5	-.678	0.498
Pebbles-Shell	13	11	-.427	0.670
Pebbles-Shell-Grass	4	20	-2.656	**0.008**
Pebbles-Shell-Sand	0	5	-1.924	0.054
Sand-Grass	3	0	-1.289	0.198
Grass	1	0	-.907	0.364
Matrix Size				
<.5cm	22	11	-1.669	0.095
.5-1cm	78	89	-1.669	0.095
>1cm	0	0		
Colors				
Black	15	9	-.978	0.328
Grey	3	0	-1.289	0.198
Black-Grey	43	16	-3.182	**0.001**
Black-Brown	35	60	-4.191	**0.00**
Brown-Grey	3	4	-.820	0.412
Burning				
Burned	82	18	-1.729	0.084
Unburnt	18	7	-1.729	0.084
Fragment				
Rim	26	36	-1.107	0.268
Side	7	11	-.652	0.514
Base	9	2	-1.683	0.092

Table 6.38 Pottery Mann-Whitney U Continued. The mean percentages of the pottery from during/after the Little Ice Age and before the Little Ice Age, as well as, the Mann-Whitney U, Z test and assumed two-tailed significance. All significant tests are in bold and highlighted.

Pottery Mann-Whitney U				
	Mean During/After The Little Ice Age	Mean Before The Little Ice Age	Z	Sig. (2-tailed)
Design				
Single Line Under Rim	0	2	-1.102	0.270
Two parallel Lines Under Rim	3		-1.289	0.198
Three Parallel Lines Under Rim	1		-.907	.364
Bulge Under Rim	6	11	-.979	0.327
Rim is Bulged	3	20	-3.009	**0.003**
Three Oblique Lines Under Rim	1		-.907	0.364
Two bulges Under Rim	3		-1.289	0.198
Single Dot Under Rim	0	4	-1.565	0.118
Indent Under Rim	0	2	-1.102	0.270
Outer Layer				
Outer Clay	10	45	-4.333	**0.00**

Chapter 7
Results: The Built Environment

7.1 Activity Systems

The density maps generated for analysis of the built environment are provided in Appendix A. Each density map was created according to the characteristics illustrated in Tables 5.3, 5.4 and 5.5 for all excavated levels. In this chapter the results of the density models are provided.

7.1.1 The Sod Level

The sod level density maps (A.1 in Appendix A) indicate a concentration of materials in the southeastern units, one unit containing 12-15 artifacts. There are little or no artifacts from near the housepit depression, nor the external pit features. The highest density artifact types are slate and fauna, located primarily in the southern units. *Ellitet* [whetstones] are only located in the southern units, while only one southern unit contains *murak* [wood].

Relative to the total count of artifacts, the sod level contains concentrations of food processing, hide processing, cutting and land/sea hunting activities. Food processing is located over most of the site. Hide processing is concentrated in the southern units. Cutting tools are also aggregated in the southern units, with less than three tools located in the very northern corner. Sea/land hunting tools are spread throughout the excavation, half located in the northern units and half in the southern. Other activities, indicated by the density maps, are two clothing production tools, four units with community tools, one unit with ornamentation, one unit with travel equip,emt, one unit with war tools, five units with wood/hide processing tools, two units with fishing tools, two units with fishing/fowling tools, two units with stone working tools and three units with wood working tools. These tools are primarily located in the southern half of the excavation.

7.1.2 Level 0-12 (in)

The level 0-12 (in) density maps (A.2 in Appendix A) indicate a concentration of artifacts in the mid-eastern units, including one unit with 36-39 artifacts. Culturally modified faunal organics are the densest artifact type, and primarily collected in the mid-eastern units. Slate is also highly concentrated in the mid-eastern section of the excavated area. *Teggalquq* [stone] and

pottery are less abundant and spread throughout the excavation. There is a small amount of *murak* [wood] and *ellitet* [whetstones] also spread throughout.

Relative to the total count of artifacts, level 0-12 (in) contains high concentrations of clothing production, food production, storage, wood/hide processing, cutting tools, snow/ice removal, fishing, fishing/fowling, worked fauna and worked slate. Clothing production is spread throughout the excavated area. Food production and storage have three or less artifacts per unit and cover the majority of the excavation. Wood/hide processing, cutting tools, snow/ice removal and fishing tools are more abundant, but are not concentrated in any location. Fishing/fowling tools are concentrated along the mid-eastern edge of the excavation, as well as, throughout the entire excavation. Worked fauna and slate are spread throughout the excavation, while being most dense in the mid-eastern units. Other activities from level 0-12 (in) are two units with children's toys, three units with community tools, two units with ornamentation, two units with travel tools, three units with war tools, eleven units with sea/land hunting, four units with stone working, and three units with wood working tools.

7.1.3 Level 12-24 (in)

The level 12-24 (in) density maps (A.3 in Appendix A) indicate a concentration of materials in the southeastern and middle units of the excavation, the unit with the highest concentration containing 50-55 artifacts. Faunal and slate cultural remains are the densest artifact type with high concentrations in the southeastern and middle units. *Teggalquq* [stones] and *ellitet* [whetstones] are also concentrated in the southeastern and middle units. Pottery is located in all units but one, while *murak* [wood] is found in the middle units and northeastern section of the excavation.

Relative to the total count of artifacts, level 12-24 (in) contains high concentrations of clothing production, food production, storage, wood/hide processing, cutting tools, snow/ice removal, fishing, fishing/fowling, sea/land hunting, worked fauna, and worked slate. Hide processing tools are concentrated in the southeastern and middle units. Food production and storage are less abundant, but found in all units but one. Wood/hide processing are spread throughout the excavation, with one concentration on eastern edge. Cutting tools are also spread throughout the excavation, but dense in the eastern wall and middle units. Snow/ice removal tools are concentrated in the southeastern section and along the northwestern units. Fishing tools

are less dense, but spread throughout the excavation. Fishing/fowling tools are also spread throughout with higher concentrations in the eastern units. Land/sea hunting have low counts and are spread throughout the excavation. Worked fauna and slate are spread throughout with concentrations in the northwestern corner. Other activities from level 12-24 (in) are two units with shafts, six units with community tools, one unit with ornamentation, three units with traveling tools, three units with war tools, five units with stone working tools and five units with wood working tools.

7.1.4 Level 24-36 (in)

The level 24-36 (in) density maps (A.4 in Appendix A) indicate a concentration of artifacts in the middle units of the excavation extending one unit to the north, east, south and west walls with the densest unit containing 55-60 artifacts. *Murak* [wood] and faunal materials are the densest artifact type. Fauna is concentrated in the middle and southeastern units, while the *murak* [wood] is located in the middle units. Slate is spread throughout the excavation with some aggregation in the middle and southern units. *Teggalquq* [stone], pottery, and *ellitet* [whetstones] have low counts, but are spread throughout the excavation. Three units in the northeastern wall also contain fiber, as well as, one unit with hide.

Relative to the total count of artifacts, level 24-36 (in) contains high concentrations of shafts, food production, storage, wood/hide processing, cutting tools, fishing, fishing/fowling, and land hunting. Shafts are found throughout the excavation with concentrations in the northern units. Food production and storage tools are spread throughout the excavation, but are more dense in the northern middle units. Wood/hide processing tools are
also spread throughout the excavation with one unit containing up to 10 artifacts in the northwestern corner. Cutting tools contain low counts but are spread throughout all excavated units but two. Fishing tools also contain low counts but are spread throughout the excavation. Fishing/fowling tools are spread throughout, one unit containing up to 10 artifacts in the southeastern eastern corner. Land hunting tools have low counts but are spread throughout the excavation. Other activities from level 24-36 (in) are four units containing hammerstones, eight units with hide processing tools, seven units with clothing production tools, five units with children's toys, six units with community tools, four units with ornamentation, two units with travel, three units with war tools, five units with snow/ice removal, one unit with a fowling tool,

nine units with stone working tools, two units with wood working tools, seven units with worked fauna and nine units with worked slate.

7.1.5 Level 36-48 (in)

The level 36-48 (in) density maps (A.5 in Appendix A) indicate concentrations of materials along the eastern units, the densest unit containing 55-60 artifacts. *Murak* [wood] is the densest artifact type, concentrated in the north eastern edge of the excavation, but spread throughout the northern half of the excavation. Slate, fauna and *teggalquq* [stones] are spread throughout the entire excavation, but are highly concentrated in the southeastern units. Pottery is found in all units but two and there are two units with fiber.

Relative to the total count of artifacts, level 36-48 (in) contains high concentrations of *ellitet* [whetstones,] shafts, food production, storage, community tools, travel tools, cutting tools, fishing/fowling tools and sea/land hunting. *Ellitet* [whetstones] are spread throughout the excavated area in low counts with a concentration in the southeastern units. Shafts are located throughout the excavation with high concentration in the middle and northeastern units. Food production and storage items are also found throughout the excavation and are concentrated in the middle northern units. Community tools are spread through the excavation in low counts. Cutting tools are also spread throughout with one dense unit in the southeast corner. Fishing/fowling are spread throughout with a concentration in the northeast and southeast corners. Land/sea hunting tools have low counts spread throughout the excavation.

Other activity associated tools from level 36-48 (in) are ten units with hammerstones, nine units with hide processing tools, three units with clothing production tools, nine units with wood/hide processing tools, three units with children's toys, one unit with ornamentation, eight units with travel tools, one unit with war tools, six units with snow/ice removal, eight units with fishing tools, two units with fowling tools, five units with stone working tools, seven units with wood working tools, five units with worked slate and one unit with worked wood. Of the activities, there are small concentrations of worked slate in the southeastern corner. The majority of the tools are also located in the southeastern corner. However, children's toys, hammerstones, hide processing and travel extend into southwestern units.

7.1.6 Level 48-60 (in)

The density maps from level 48-60 (in) (A.6 in Appendix A) contain the artifact densities and the maps of the wood drawn by Kowta (1963). The maps indicate a concentration of artifacts in the middle and northern units, the densest units containing 55-60 artifacts. *Murak* [wood] is the densest artifact type, concentrating in the middle and northern units. Fauna follows and is densest in the middle and mid-northern units. Slate and *teggalquq* [stone] are spread throughout the excavated area with single dense units, slate in the middle and on the western wall. Pottery is in all excavated units but four. Fiber is also found in six units.

Relative to the total count of artifacts, level 48-60 (in) contains high concentrations of *ellitet* [whetstones], shafts, wood/hide processing, food production, storage, community, travel, cutting tools, fishing/fowling and land/sea hunting. Elittet [whetstones] are spread throughout the excavated area in low counts. Shafts are also spread throughout with concentrations in the middle and mid-western units. Wood/hide processing tools are spread throughout in low counts. Food production is spread throughout with a concentration in the middle and northeast. Storage is spread throughout with concentration in the middle. Community tools are spread throughout the majority found in the northeastern and southwestern units. Travel tools are concentrated in the middle and northwestern units. Cutting tools are spread throughout with a concentration in the middle. Fishing and fowling are spread throughout with the majority in the northeastern units. Land/sea hunting tools are spread throughout.

Other activities from level 48-60 (in) are six units with hammerstones, eight units with hide processing tools, three units with clothing production tools, seven units with children's toys, five units with snow/ice removal, six units with fishing tools, one unit with fowling tools, one unit with stone working tools, five units with wood working tools, one unit with worked fauna and one unit with worked slate. These tools are spread throughout the excavation, but there are concentrations of tools in the middle units of the excavation. Clothing production tools and worked fauna are only found on the south and western walls and one fowling tool is from the northern wall.

7.1.7 Level 60-72 (in)

The density maps from level 60-72 (in) (A.7 in Appendix A) contain the artifact densities and Kowta's (1963) wood maps. The maps indicate a concentration of artifacts in the middle and

northern units with the densest unit containing 35-40 artifacts. *Murak* [wood] is the densest artifact type, concentrating in the middle and northeastern units. Fauna artifacts follow the densest locations in the mid-eastern units. Slate, *teggalquq* [stones] and pottery are located in low counts throughout the excavation, but *teggalquq* [stones] have a single dense unit along the northern wall. There is a single unit in the northwestern corner with hide and five units containing fiber in northeastern corner.

Relative to the total count of artifacts from level 60-72 (in) contain high concentrations of whetstones, shafts, wood/hide processing, food production, storage, travel, cutting tools and land/sea hunting. Whetstones are spread throughout and have a concentration in the northwestern corner. Shafts are spread throughout with concentrations in the northeastern units and two denser units in the southern blocks. Wood/hide processing are spread throughout with low counts. Food production and storage are spread throughout with low counts and have a concentration in the northwestern corner. Travel tools are spread throughout and have a concentration in the center of the excavated area. Cutting tools are spread throughout with low counts. Land/sea hunting are spread throughout with low counts.

Other activities from level 60-70 (in) are four units with hammerstones, seven units with hide processing tools, one unit with a clothing production tool, five units with children's toys, six units with community tools, one unit with ornamentation, two units with snow/ice removal, seven units with fishing tools, nine units with fishing/fowling tools, one unit with stone working tools, five units with wood working tools and one unit with worked slate.

7.1.8 Level 72-84 (in)

The level 72-84 (in) density maps (A.8 in Appendix A) have concentrations of materials in the northern corner of the excavation with 12-15 artifacts. *Murak* [wood] has the densest artifact counts in the northern corner, while *teggalquq* [stone] and pottery are spread throughout at low counts. Fauna is located on the northern and southern corner. Relative to the total count of artifacts from level 72-84 (in), there is a high densities of food production and storage spread throughout the excavation. Ellitet [whetstones], hammerstones, shafts, hide processing tools, wood/hide processing tools, cutting tools, fishing tools, land hunting and wood working tools are located in low counts in one or two units.

7.1.9 Level 84-96 (in)

The level 84-96 (in) density maps (A.9 in Appendix A) have concentrations of materials in the northern corner of the excavation, one unit with 12-15 artifacts. *Murak* [wood] has the densest artifact count in the northern corner, while pottery and stone are located in low counts throughout the excavated area. Slate and fauna are located in two or three units. Relative to the total count of artifacts from level 84-96 (in) there are high counts of food production and storage, which are located in all excavated units with low counts. *Ellitet* [whetstones], hammerstones, shafts, hide processing, wood/hide working, cutting tools, fishing, land hunting, and wood working are located in one or two units.

7.1.10 Level 96-108 (in)

The level 96-108 (in) density maps (A. 10 in Appendix A) have concentrations in the middle, northern and southern units, one unit with 6-9 artifacts. Slate has the densest artifact concentration in the middle unit, while pottery, stone and wood are located in low counts throughout the excavated area. Fauna is located in one unit. Relative to the total count of artifacts from level 96-108 (in), there are higher counts of whetstones and cutting tools. Hammerstones, shafts, food production, storage, community tools, fishing tools and worked slate are found in one or two units.

7.1.11 Level 108-120 (in)

The level 108-120 (in) density maps (A.11 in Appendix A) have concentrations in the southern two units of the excavation with six-nine artifacts. None of the artifact types are spread throughout the excavated areas entirety, but slate, fauna, stone pottery and wood are found in two or three units. Hide is located in one unit. Relative to the total count of artifacts from level 108-120 (in), there are high concentrations of food production and storage, covering three units. Whetstones, hammerstones, wood/hide production tools, cutting tools, fishing tools, fishing/fowling tools and land hunting tools are located in two or three units.

7.1.12 Level 120-132 (in)

The level 120-132 (in) density maps (A.12 in Appendix A) have concentrations in the middle two units of the excavated area, one unit with 12-15 artifacts. Wood has the densest

artifact concentration in the middle unit, while pottery is spread throughout. *Teggalquq* [stone] is found in three units, while fauna and slate are found in one or two units. Relative to the total count of artifacts from level 120-132 (in), there are high concentrations of food production and storage spread throughout all the excavated units. *Ellitet* [whetstones] are located in three units, while shafts, hide processing tools, wood/hide processing tools, community tools, cutting tools and fishing tools are only found in one or two units.

Chapter 8
Discussion

This chapter is divided into three sections each offering interpretations to this thesis's research objectives. The first section discusses the culturally modified materials, interpreting the functionality and the change and continuity of the artifact's characteristics. The second section provides interpretations of the built environment including a discussion on formation processes, activity areas, and systems of settings (Rapoport 1990). The third section explores the change and continuity of artifacts during the Little Ice Age.

8.1 Material Collection, Production of Tools and the Function of the Culturally Modified Materials

8.1.1 Culturally Modified Teggalquq [Stones]

Yup'ik communities collect and use culturally modified *teggalquq* [stones] according to their properties and characteristics, including the mineral content, the color, weight and solidity (Fienup-Riordan 2007). *Teggalquq* [stones] are chosen for these properties specifically in the construction and implementation of certain tools. The legacy of culturally modified *teggalquq* [stone] has carried into iron-made tools including *uluaq* [ulus], *cavek* [harpoon tips], *qalugyaq* [lance points] and *caviggaak* [men's knives]. Maqi's, or steam baths, still take *lingarnat* [basalts good for heating], for heating. While hard, abrasive *ellitet* [whetstones] are used to sharpen iron instruments.

Slate is the most utilized raw material in the production of culturally modified *teqqalqut* [stones] followed by siltstone, sandstone and granite. In the collection, slate is the only material used in the production of blades, *keligaun* [scrapers], *uluaq* [ulus] *cingilek* [arrowheads], *cavek* [harpoon tips], *qalugyaq* [lance points]. Suggesting that slate is the most desirable *teggalquq* [stone] to produce cutting, hide processing and hunting tools throughout all levels of the excavation. In only one instance is a blade tool made from siltstone rather than slate.

Ellitet [whetstones], the most abundant tool collected from all four units, is made from siltstone or sandstone and once from granite. Suggesting that siltstone and sandstone are the most abrasive *teggalquq* [stones] and preferred in producing *ellitet* [whetstones]. Pebble hammerstones and *passin* [pestles] are primarily produced from granite although siltstone and sandstone are used sparsely.

The slate tools are either black, dark grey or marbled grey and black, while the *ellitet* [whetstone] materials are light grey. Other colors identified are blue/grey, green, tan and blue, which are granite, gneiss or rhyolite material. According to interviews with Elders, the black slate comes from the *Tuyuryaq* area, while the marbled grey and black slate originates in the Security Cove area as illustrated in Figure 8.1 (Fienup-Riordan 2007; Fienup-Riordan *et al.* 2015). All but one of the hunting tools and all the *uluaq* [ulus] are constructed by the (potentially) local black slate material. The blade tools are also primarily constructed from black slate, as well as light grey slate, dark grey and marbled grey/black slate. The marbled grey/black slate seemingly originates in the Security Cove area. The results suggest that *Temyiq Tuyuryaq* residents locally collected many of the raw resource material. The results also suggest that the residents preferred the local material to produce cutting and hunting tools. Additionally, it may indicate that the slate quarry was easier to access than others. The continuity of the materials indicates that this quarry was used frequently and continuously for at least 400 years.

Four *ellitet* [whetstones] and one *passin* [pestle] were identified as *arviiq* [dark, hard, abrasive stone] from *Arviiq* [Platinum]. In Fienup-Riordan (2007) and Fienup-Riordan *et al.* (2015) Elders relate that *arviiq* [hard, dark abrasive stones] are the best materials for grinding because they are hard and abrasive. Suggesting that, although the *ellitet* [whetstones] in the collection are primarily siltstone and sandstone, *arviiq* [hard, dark, abrasive stone] was preferred for grinding materials when it was obtainable. Arviiq [hard, dark, abrasive stone] was excavated from two occupation ranges and is still preferred today, suggesting use is continuous.

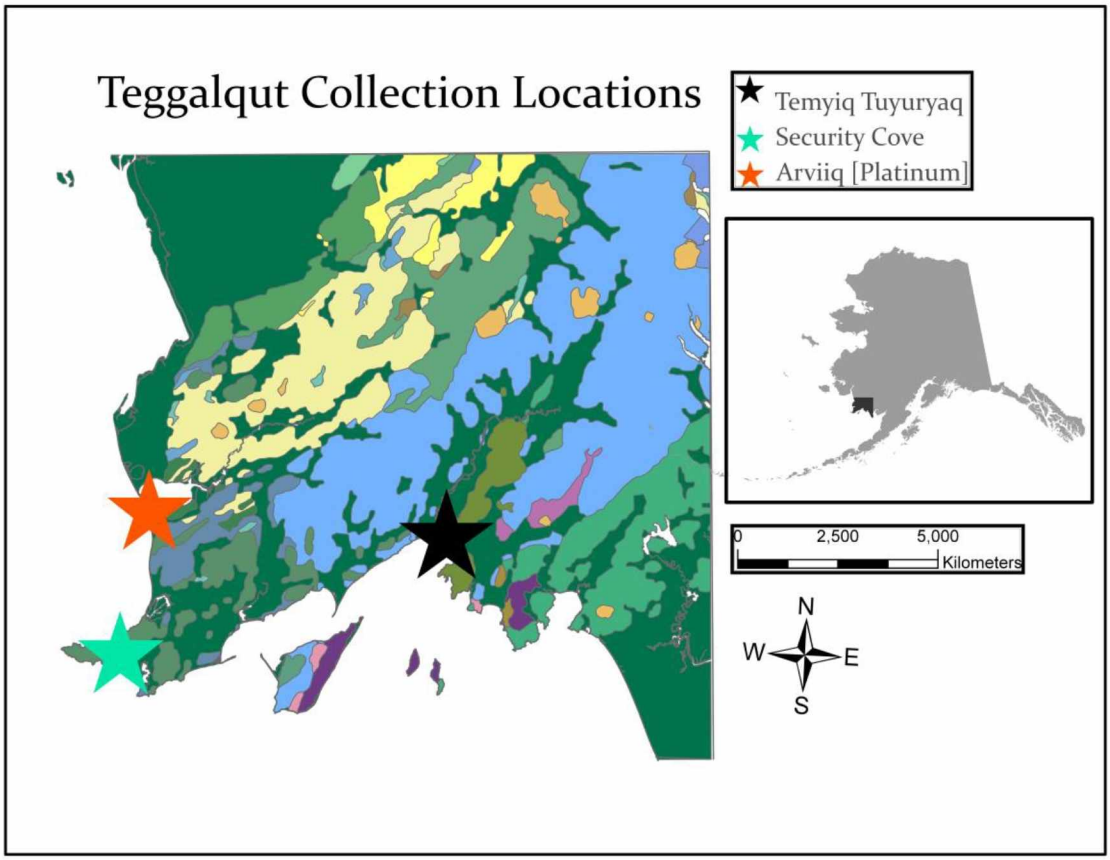

Figure 8.1 Culturally Modified *Teggalquq* [Stones] Collection Locations. The colored stars indicate collection locations for *teggalquq* [stone] raw material sources. The orange star is *Arviiq* [Platinum], the turquoise star is Security Cove and the black star is *Temyiq Tuyuryaq*. Geologic regions provided by USGS.

Yup'ik *teggalquq* [stone] characteristics were evaluated based on the type of material, the hardness, the color and tool typology. *Ulukaq* [black slate materials] makes up the majority of the blade-like tools, suggesting that it was the most popular cutting tool. *Kukupat* [marbled slate, easy to carve] also were made into blade-like tools and the ease of which they were ground was noted in the interviews, suggesting that they were a sought-after material. *Teggalquiag* [genuine rock] are associated with *qetruk* [hard stones], *ellitet* [whetstones] *and uqu'urniq* [light, colored sandy stones] characteristics. *Ellitet* [whetstones] retain these characteristics continually through the excavated materials. Ellitet [whetstones] are also the most abundant material in the collection, suggesting that the excavated area was continually used for the production and reuse of these tools.

Culturally modified *teggalquq* [stone] production was analyzed using Graesch's (2007) six stages of ground slate production and through traditional categories including snapping,

chipping, polishing and surface grinding. Although Kowta (1963) did not collect all the *Temyiq Tuyuryaq* materials, he did collect the fragments of slate materials regardless of its stage of reduction. This allowed for an examination of the production of the slate materials. The ground tools were primarily stage two, three, and five. This suggests that the area was used for producing tools, storing and using the ground stone tools and for the discard of these tools. Stage two consists of tools with edge modification including perimeter chipping, thinning and fractures. Stage three consists of unifacial grinding, while stage five is the hafting of materials to handles. Some of the materials are also bifacially ground and bifacially beveled, while very little of the material is in raw cobble stage. The rarity of whole slate cobbles suggest that the slate was broken into smaller portions and brought back to the village. The increase of stage two tools suggests that the slate was worked in the excavated area or that some of the slate tools were not solely ground, rather chipped. Stages three through six were analyzed as a part of the finished tool structure. Many of the tools are unifacially ground including scrapers and knives, while the *uluaq* [ulus] and hunting tools are bifacially ground. There is wearing or holes on the knives, scrapers and tools indicating hafting, suggesting the tool was used and then discarded.

Beyond ground slate tools, all the materials were analyzed as snapped, chipped, polished and ground. Much of the collection is chipped and ground. Chipped tools include many of the slate tools and the majority of the non-slate tools. Snapped tools are all slate materials, thinned by snapping the brittle slate into a workable size. Polishing is a result of grinding and use, many of the tools illustrated signs of polishing, suggesting that they were used or ground more than one once. Of the blade technology, the majority are chipped, and all except for two are ground into shape. *Uluaq* [ulus] and hunting tools are all ground and bifacially beveled. Suggesting that the ground slate tools are snapped or chipped into a workable size, then ground to the desired shape.

On the other hand, *ellitet* [whetstones] are chipped to a workable shape and then used. Elders from Fienup-Riordan *et al.* (2015) suggest that *ellitet* [whetstones] are shaped according to which tool they are to sharpen. This was not assessed during analysis; however, it suggests that *ellitet* [whetstones] are not merely broken into workable chunks and then used as a grinding stone, rather they are methodically shaped through chipping and grinding into the right size for making a specific tool. Additionally, all the *egun* [adzes] are chipped and ground into shape. *Egun* [adzes] indicate both bifacial and unifacial beveling.

The tools assigned to gendered are evenly distributed throughout the analyzed collection. The tools are primarily used by both genders. However, from 550-600 cal BP there are no male tools, only dual and female tools, suggesting that during this occupation the excavated area was a women's working area rather than a shared space. The seasons of tool use are also similar throughout the occupation, many of the tools utilized on a year-round basis. However, the seasonal use of hunting technology suggests a year-round occupation of the village.

Figure 8.2 Culturally Modified *Teggalquq* [Stone]. Upper left: *cavek* [harpoon] tip; upper middle: *keligaun* [scraper]; upper left: *keligaun* [scraper]; middle left: knife; middle: *cavek* [harpoon] point; middle right: pestle/hammerstone; lower left: *kepun* [adze].

Figure 8.3 Uluaq [Ulu] Variations.

8.1.2 Culturally Modified Faunal Organics

According to *Tuyuryaq* residents, animals targeted for consumption include a variety of salt and freshwater fishes, migratory fowl and eggs, land game animals including *tuntu* [caribou (*Rangife tarandus*)], *ceniq'aq* [beaver (*Castor canadensis*)], *aatagaq* [sea otter (*Enhydra lutris*)], aaquyaq [river otters (*Lontra canadensis*)], *avelqurpaq* [lemmings (*Cricetidea*)], *iliguak* [muskrat (*Ondatra zibethicus*)], *qaterli* [arctic fox (*Vulpes* lagopus)], and *cikik* [arctic ground squirrel (*Spermophilus parryii*)], as well as sea mammals including *asveq* [walrus (*Odobenus rosmarus*)], various seals, and *apakcuk* [stellar sea lions (*Emetopias jubatus*)] (Fall *et al*. 2012). Rather than researching the consumed foods this project focuses on the technology produced from the animal remains.

Surprisingly, only the remains of *tuntu* [caribou (*Rangifer tarandus*)], and *asveq* [walrus (*Odobenus rosmarus*)] are identifiable; although a percentage of the collection is unidentifiable. *Tuntu* [caribou (*Rangifer tarandus*)] make up almost all the tools. Of the identifiable species, all the scraper/wedges and fishing equipment, and all but one of the handles and hunting tools are constructed from *tuntu* [caribou (*Rangifer tarandus*)]. Suggesting that the bones and antlers of

tuntu [caribou (*Rangifer tarandus*)] are readily available and easily constructed into tools. Elder's from Fienup-Riordan *et al.* (2015) suggest that shaping walrus ivory is difficult and it needs to be consistently damp to not crack. Although ivory is prized now as artwork and distributed for commercial purposes, the Elder's knowledge suggests that in the past *tuntu* [caribou (*Rangifer tarandus*)] materials were the most easily shaped and used most often. *Tuntu* [caribou (*Rangifer tarandus*)] is used throughout the whole collection for the construction of tools.

Directly correlated to the type of bone used in tool production is the hunting or antler collecting locations. According to informants from *Tuyuryaq* in Fall *et al.*'s (2012) study, *tuntu* [caribou (*Rangifer tarandus*)] are hunted from the *Tuyuryaq* area over the peninsula to *Arviiq* [Platinum] and then south to *Mamterat [Goodnews Bay]. Tuntu* [caribou (*Rangifer tarandus*)] are also hunted along the Togiak River and adjacent valleys. *Asveq* [walrus (*Odobenus rosmarus*)] are hunted in the Bristol Bay and on nearby islands, such as *Qayassiq* [Walrus Island]. The results suggest that the *Temyiq Tuyuryaq* people most often traveled to *tuntu* [caribou (*Rangifer tarandus*)] locations for hunting or antler collection.

The elements most often employed in the production of tools are antler, bone and then ivory. All the scraper/wedges, the majority of the handles and hunting tools and half of the *everqunn* [awls], needles and fishing tools are constructed from antler. Suggesting antler was highly sought after for constructing a variety of tools. Of the tools constructed by antler, the scraper/wedges are made from the beam and the pedicle/beam of the antler, handles are constructed from the beam, pedicle/beam and tine, clothing production from the pedicle/beam and tine, hunting tools only from the tine, and fishing tools from the beam. Indicating that all element areas of the antler are used in the production of these tools. The larger tools such as the scraper/wedges and handles are made from the beam and pedicle, the sturdier element, whereas the hunting equipment and clothing production tools are constructed from the naturally pointed tines. Bone elements compose half of the clothing production materials and a fraction of the hunting and fishing tools.

The burning of culturally modified fauna was assessed to explore the production and/or reuse of faunal technology. According to Shipman *et al.* (1984) the color of the burning is dependent upon the temperature and duration of exposer to fire, the composition and size of the bone and the position of the bone to the heat source. Most of the collection is unburnt, while a

fraction is burned black and black/brown. The black and brown stages of burning suggest that the remains were exposed to high heat and low duration. This is not consistent with hearth features or burning for discard of bones. Suggesting that some of the materials were burned during production or as a byproduct of a fire.

In Yup'ik Elder Paul John's stories entitled, *Enret Aulukellrata Iqukegtarii* [A good end for taking care of bones], he denotes the importance of burying in a spot out of someone's path. If people didn't abide by these rules they would run out of food (John 2003). Although the bones in Elder John's story are used in consumption rather than as tools, organic faunal tools, at the end of their lifecycle they may have been treated in a similar manner. Thus, becoming a part of the built environment as they are buried. Suggesting that burning happened before discard and perhaps during the construction process.

Weathering was assessed to understand the relationship of bone preservation and environmental impacts according to Behrensmeyer's (1978) five stage model. The analyzed remains indicate elevated weathering in stages zero to three while only one remain is stage four. Suggesting that the bones had limited exposer to weathering damage. The limited above surface exposer is consistent with the traditional sod house cycle and the burying of midden material to infill gaps between houses. It also suggests that culturally modified fauna is rapidly buried after use. The means of the weathering throughout each time period suggest that during the later occupation bones were exposed more often to the elements. Indicating that during the early occupation culturally modified faunal organics were rapidly buried and during later occupations the remains were exposed for longer. This suggest that houses were rapidly recycled during the early occupations, middens buried quicker, while in the later occupations people utilized the area less frequently. This is constant with the move across the bay.

The production of the tools indicates a continual manufacture from chipping, polishing, grinding and drilling—suggesting that the tools are chipped and ground into shape. Rounded hollows are also drilled into some of the tools, which seemly are decorative similar to decorations found on the pottery. Many of the tools have signs of use-wear and little under half are broken from use. The means of discarded tools don't significantly change throughout the occupation, indicating that the use patterns of these tools are consistent throughout the occupation.

The seasonal use of the tools is evenly distributed across the year. Many of the tools are used in all seasons. (Fienup-Riordan 2007). The tools, scrapers/wedges, handles, clothing production are used on a year-round bases. Whereas the large game hunting tools are used primarily in the summer and fall with half of the tools also being used in the winter and spring. Fishing tools are used across all four seasons equally. Indicating that people occupied the village on a year-round basis from the earliest to latest occupations. The tools traditionally used by one gender to conduct certain tasks are also equal across excavation, with an increase in female and dual-used tools at 600 cal BP.

Figure 8.4 Culturally Modified Faunal Organics. Upper right: *asaaquq* [toggling harpoon]; upper left: *everqunn* [awl]; middle left: *nalayarrsuun* [salmon harpoon]; middle right: scraper/wedge; lower left: scraper/wedge; lower right: *caniryak* [arrow foreshaft].

Figure 8.5 Culturally Modified Faunal Organics. Upper left: ivory piece; upper right: *aklegaq* [seal dart head]; lower left: root digger; lower right: net weight.

8.1.3 Culturally Modified Murak [Wood]

Yup'ik groups traditionally used t*ep'at* (driftwood) to build houses, *qayaq* [kayaks], *ikmaraq* [dogsleds], hunting tools, weapons for warfare, butchery tools, *cukangegautaq* [bows], *kumartessuun* [fire drill boards], *kumarcissuun* [fire drills], children's toys, avangcaq [masks], *inuguat* [family dolls] and story knives. *Murak* [wood] was also used to smoke fish, steam bath and cook food. Certain types of *murak* [wood] were chosen carefully for the level of hardness, texture of the grains, flexibility, and dryness; all of the characteristics taken into careful consideration depending upon the intent of its use (Alix and Brewster 2004; Fienup-Riordan 2007; Wheeler and Alix 2004).

According to interviews with *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] and communities conducted by ethnographer, Ann Fienup-Riordan (2007), *murak* [wood] was never taken for granted because of its rarity on the treeless coast. "Although driftwood was ubiquitous and plentiful in many areas, it was never taken for granted. During midwinter dances men sang songs and wore masks representing the spirit of driftwood to elicit future abundances" (Fienup-

Riordan 2007: 55). *Murak* [wood] carried a spirit and groups could respect the spirit by collecting *murak* [wood]. Villages with plentiful *murak* [wood] were also more attractive to animal spirits; thus the animals were more likely to be caught for food (Fienup-Riordan 2007). In the traditional *Kukugyarpak* story told by Annie Blue of *Tuyuryaq*, Kukugyarpak, a *nukalpiaq* [great hunter], was traveling along the ocean and found a large sod house full of women married to tep'at [driftwood]. The women's husbands came back when the women started running out of food and brought them *nayiq* [ringed seal (*Pusa hispida*)], *issuriq* [spotted seal (*Phoca largha*)], *qasrulek* [ribbon seal (*Histriophoca fasciata*)], *asveq* [walrus (*Odobenus rosmarus*)] to eat. (Blue 2007). The story implies *tep'at* [driftwood] was important for bringing food back to the village.

Different species of trees changed names as the tree transformed from *napat* [greenwood] to *tep'at* [driftwood] and then as drifted ashore on beaches becoming *murapita* [real wood], demonstrating a part of the *murak* [wood] lifecycle (Fienup-Riordan 2007). As well as different names for the *murak* [wood] lifecycle, there were names for important properties of the *murapita* [real wood] identified by interviewee's of Ann Fienup-Riordan's work. *Tep'at* [driftwood] was carefully selected according to the properties of the *murapita* [real wood] used for building or tool making (Blue 2007; Fienup-Riordan 2007).

In the Alaska Journal of Anthropology, anthropologists, Alix and Brewster (2004: 48), present the importance of driftwood, "as a natural resource along the Yukon and Kuskokwim rivers….(focusing) on what lies behind the notion of "good or right wood" vs. "bad wood" as conceptualized in Athabascan and Yup'ik communities." The authors visited *Tuyuryaq* and interviewed multiple Elders on the importance and origin of *tep'at* [driftwood]. The authors mention in all instances the traditional "carvers look at the grain and smoothness of the wood when assessing the condition of a log. They preferred straight-grained wood, typically *equgpigaq* [spruce (*Picea spp.*)], that did not have cracks or knots" (Alix and Brewster 2004: 52). According to interviewee's, *murak* [wood] was used for heating houses (dry wood, driftwood, and green wood), smoking fish, heating the maqi (driftwood), and wood working (Alix and Brewster 2004).

To analyze the types of *murak* [wood] preferred for making tools, I analyzed the grain type. The majority of the culturally modified *murak* [wood] is constructed with straight grained wood. Suggesting that the residents preferred straight grains for wood working. Grain directions are primarily longitudinal suggesting that residents also preferred tools cut longitudinally. Grain

texture is primarily fine texture, however coarse texture is just less than 50% of the samples. Suggesting that there was no discrimination between textures during tool construction.

Some characteristics of Yup'ik *murak* [wood] preferences were analyzed using grain analysis. The majority of the collection are *unarciaq* [straight-grained from the straight, thick part of tree trunk] and *akqurrillnqug* [without knots]. Tools demonstrating high abundances of these two characteristics include many shaft fragments, all the *egun* [throwing boards], half of the *cukangegautaq* [bows], the majority of the handles, the majority of the fire-making equipment, the majority of the basket bottoms and all the *inuguat* [family dolls]. Suggesting that *unarciaq* [straight-grained] and *akqurrillnqug* [without knots] were desired in the construction of these tools. Yup'ik Elders suggest that *unarciaq* [straight-grained] *murak* [wood] is good for constructing materials which need to be straight such as drying racks, kayak parts, shafts, stringers and handles (Fienup-Riordan 2007). This is reflected in the *murak* [wood] technology from the collection.

Avuaralget [mixed-grained *murak* with more than one grain type and grain direction] is the next most abundant characteristic. *Avuaralget* [mixed-grained] tools are less abundant, but included less than half of the shaft fragments, half of the *cukangegautaq* [bows], half of the handles, less than half of the fire-making equipment and some of the basket bottoms. Implying that mixed grain was used, but not as desired in the construction of tools as straight grained wood. As suggested by Elders, mixed grain wood is good for materials needing bent such as *qayaq* [kayak] ribs, binding materials and bentwood buckets and bowls (Fienup-Riordan 2007). *Avuaralget* [mixed-grained] tools such as *cukangegautaq* [bows], some handles and basket bottoms were from *murak* [wood] curved during construction.

Akqut [with knots] and *equgcilria* [smooth wood that twists slightly] are the least abundant characteristics in the collection. Elders describe *akqut* [with knots] as a wavy grain type, caused when the grains of the *murak* [wood] to move around a knot. Wavy grain types are used in some materials, but often the akqut [wood with knots] are hard to construct tools with and are used to start fires. *Equgcilria* [smooth wood that twists slightly] is good in the construction of bentwood material including *cauyaq* [drums], kayak ribs, ladles, spoons, containers and avangcaq [masks] (Fienup-Riordan 2007). Only a small percent of *equgcilria* [smooth wood that twists slightly] are used in shaft production, and only *akqut* [with knots] is

used in the flat board production. Some of the flat boards also contain knots which are smoothed until the board is flat.

The use of coniferous trees [softwoods] and angiosperm trees [hardwoods] are evenly collected throughout the village occupation. Of the tools, there is little distinction between softwood and hardwood gathering or material collection location. Trees such as *equgpigaq* [spruce (*Picea spp.*)], *elnguq* [birch (*Betula spp.*)] and *auguqsuliq* [alder (*Alnus spp.*)] were used to produce tools, while some wood was best for fire materials like *avngulek* [cottonwood (*Populus sect Aigeros*)] or *cuyanguaq* [willow (*Salix spp.*)]. The shaft fragments, the handles, the fire equipment and the flat bottoms were equally coniferous and angiosperm, while both the *egun* [throwing boards] were coniferous, the *cukangegautaq* [bows], were primarily angiosperm, and the *inuguat* [family dolls] were only angiosperm. This suggests neither the collection location nor tree type is the most important characteristic in wood selection. However, the sample size is too small to provide definitive results. The collection locations and tep'at [driftwood] origin locations are illustrated in Figures 8.6 and 8.7.

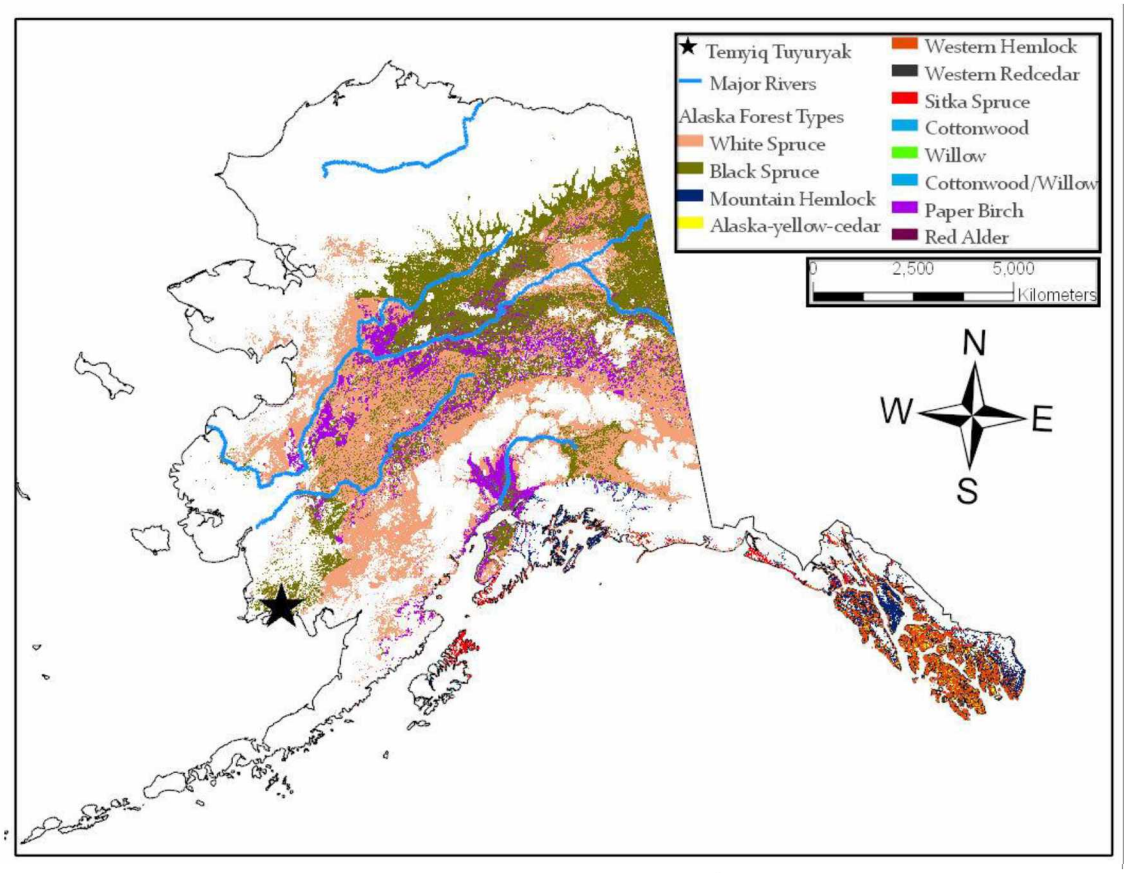

Figure 8.6 *Murak* [Wood] Dispersal Alaska. Types of major wood locations in Alaska. *Temyiq Tuyuryaq* indicated by the black star. Wood locations map provided by USGS.

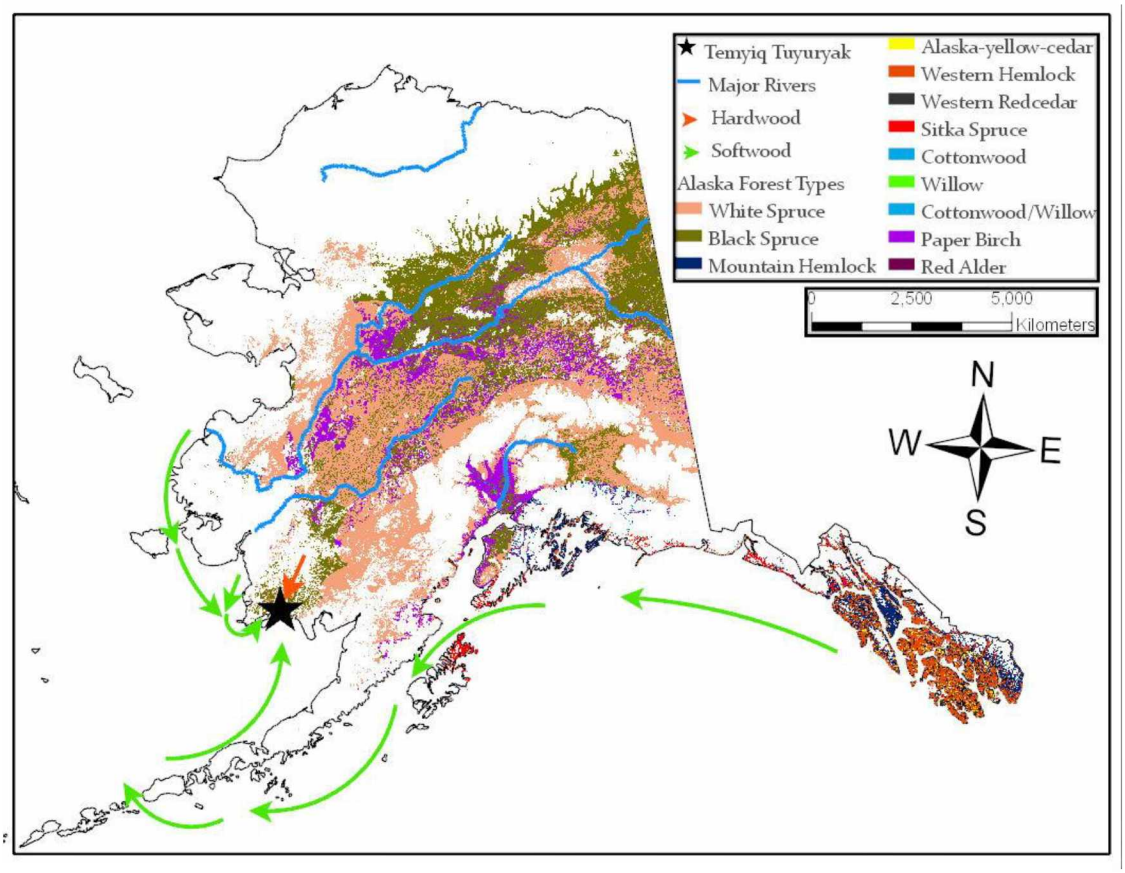

Figure 8.7 ***Murak*** **[Wood] Angiosperm (Hardwood) and Coniferous (Softwood) Drift to Bristol Bay.** The map illustrates the flow of *tep'at* [driftwood] to *Temyiq Tuyuryaq* indicated by the black star. Wood location map provided by USGS.

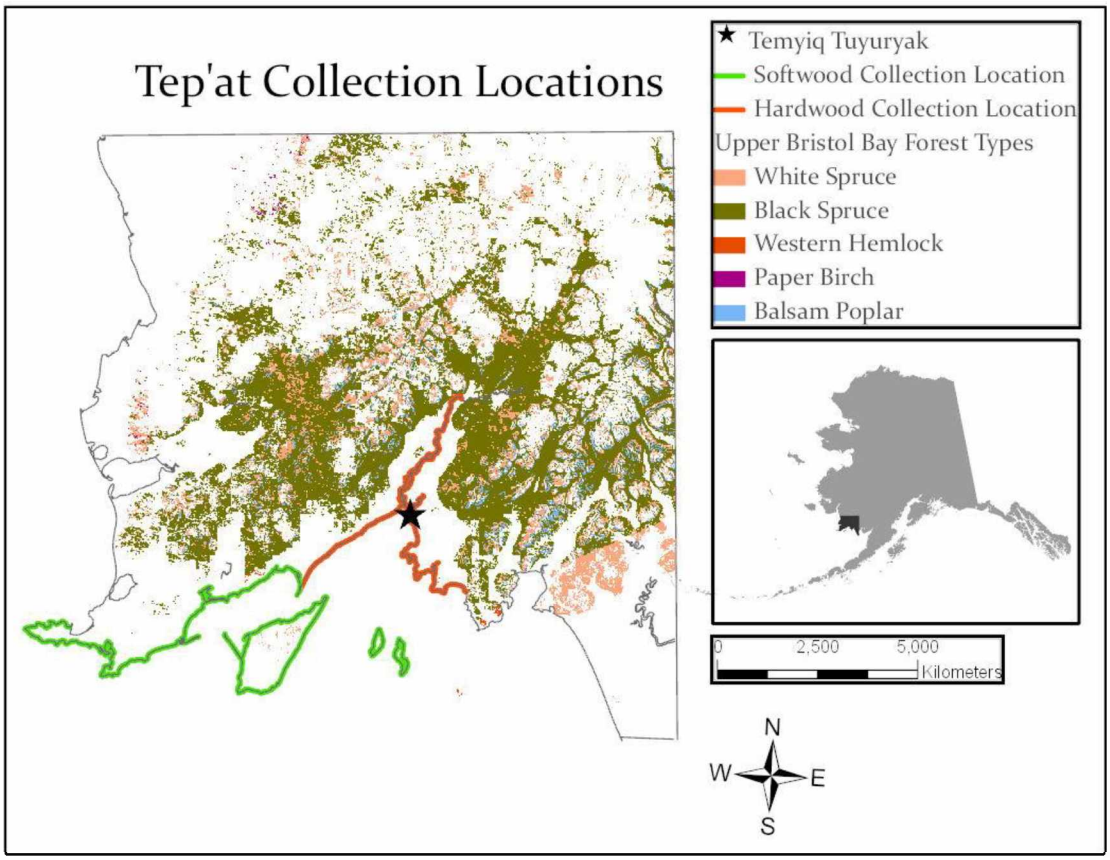

Figure 8.8 *Tep'at* [Driftwood] Collection from *Temyiq Tuyuryaq*. Collection locations indicated by *Tuyuryaq* woodcarvers in Alix and Brewster 2004. Wood location map provided by USGS.

Less than half of the culturally modified *murak* [wood] is use worn, including cutting, chipping and breaking. Most the shafts and *cukangegautaq* [bows] and both the *egun* [throwing boards] are broken, while the *inuguat* [family dolls] are not worn, and only two of the flat boards are cut. As indicated by interviewees, ethnographies and nearby excavations, much of the *murak* [wood] technology is repurposed for building materials, potentially explaining the fragmentary nature of some of the tools—like the shaft fragments (Fienup-Riordan 2007; Fienup-Riordan *et al*. 2015).

The seasonal use of the tools is also evenly distributed throughout all the seasons and across the total occupation. Many of the tools are used year-round, hunting tools utilized during seasonally specific times. The gender use of culturally modified *murak* [wood] is also equally distributed throughout the occupation, many tools used by both genders. However, from modern-400 cal BP the tools are all women's tools dropping to zero women's tools from 400-500 cal BP,

whereas there is an increase in male associated tools. This may indicate a change in the use of the space over time, however, the equality of the tools demonstrated that the space was a shared by both genders throughout the occupation.

There are also ten children's toys dispersed through each level except from modern-400 cal BP, distinguishing the excavated area as a space for children to learn adult tasks. Children's *cukangegautaq* [bows] are located alongside children's *inuguat* [family dolls]. According to interviews and oral stories, it was often the children's job to go and hunt small game and birds, educating the young hunters and providing a valuable service for the village (Blue 2007; Fienup-Riordan 2007). Girls played in *inuguaq* sessions, making real life situations from their dolls, learning how to sew clothing and take care of the miniature wooden humans (John 2010).

Figure 8.9 Culturally Modified *Murak* [Wood]. Upper left: three-pronged bird dart base; upper middle: *egun* [throwing board}; upper left: child's *cukangegautaq* [bows]; middle left: model paddle; middle: child's arrow shaft distal end; middle left: *kumartessuun* [fire drill boards]; lower left: flat-end *nuiq* [bird dart]; lower middle and right: *inuguat* [family dolls].

8.1.4 Pottery

The *Tuyuryaq* pottery combines clay with a mixture of pebbles, grass, sand and shell. Many of the pots contain a secondary outer layer made with light brown clay and large pieces of woven grass. Clay pots began appearing in excavated southwestern and western Alaskan precolonial villages around 2,500 BP (Harry and Frink 2008). Early designs include thin-walled, barrel-shaped bowls tempered with hair, feathers or fibrous material and are often associated with a check-stamped design. Around 1,000 BP pottery shifted to thick-walled pots, tempered with gravel or pebbles and associated with line-and-dot designs. (Dumond 1984; Harry and Frink 2008).

As indicated by Yup'ik Elders from western Alaska, the construction of clay pots was an arduous task in the damp, coastal environment. Pots were constructed in the summer after the fish run, as it would have been hard any other time of the year due to dampness. The pots were not fired but left to harden by a fire or placed in the smokehouse to dry with the fish. Pots could take up to six months to dry. The constructed vessels were porous and inclined to crumble. The porousness was due to the material and the lack of hardening from a proper kiln firing. However, allowing the pots to soak in animal fats or blood, the pours often filled and were water-tight (Harry and Frink 2008).

For cooking, women set the vessels directly into a fire until the water simmered. Once the water was simmering, meat was quickly parboiled so at least the outer layer was cooked. The meat was only quickly set in the hot water and consumed almost raw or still partially frozen (Fienup-Riordan 1983; Harry and Frink 2008; Harry *et al.* 2009). By directly placing the pot over the fire, the water rapidly heated and the heat source was no longer needed. The rapidly heated water was advantageous because less *murak* [wood] was wasted (Harry *et al.* 2009). The vessels also offered a simple way to store foods.

According to Elders from Quinhagak, northwest of *Tuyuryaq*, a grey clay was collected at a place called *Ciranaaq*. *Ciranaaq* was located in the mountains southeast of Quinhagak above *Mamterat* [Goodnews Bay] (Fienup-Riordan *et al.* 2015). Although there were potentially clay sources closer to *Tuyuryaq* no locations have been recorded. The clay was then tempered with local sand, pebbles, grass and/or shell. Most the clay in the *Tuyuryaq* collection is tempered with pebbles or pebbles mixed with a variety of grass, sand and shell. Suggesting that the preferred method of preparation is with pebbles, giving the vessel a desired rigidity while the

fibrous materials, such as grass and shell, stop the pot from being porous and brittle. The pebbles are primarily size .5 cm to 1 cm. Although, pebbles are the most popular temper source, there is a higher variety of pebbles mixed with fibrous materials before 500 BP, implying that the use of the fibrous materials was used less after 500 BP.

The color of the pottery is dependent upon the type of clay, sherd burning, and weathering. The colors assessed are primarily light brown or grey/black. The black colors are from burning rather than clay color. The high percentage of black/grey sherds suggests that most the pottery was grey in color but burned through cooking processes. The light brown pottery is also present and often discolored through burning to a darker brown or black color.

The fragment area was assessed to explore the types of pots produced during occupation. Only the rim, pot side, and base was identified. From the fragmentation patterns, there are at least five different pots. This was assessed by the number of base fragments. During analysis I attempted to refit bases within the same unit and level, two of the bases refit, leaving a minimum number of five pots. Four pots were located in 400-500 cal BP while one pot was collected in 550-600 cal BP.

To assess the pottery designs, I described the type of designs present and if the designs were repeated. *Tuyuryaq* community members explained that the symbols represent familial ownership and are the identifying marks of multiple generations of women who made the pottery. The line-and-dot pottery motifs are also reminiscent of the Yup'ik circle-and-dot motif called *ellam iinga,* which is the conceptual symbols of *Ellarpak* [awareness; the universe]. "The use of this decorative motif was associated with both spiritual vision and the creation of a pathway between the human and spiritual worlds" (John 2010: 17). As well as representing familial ownership, these designs may carry a spiritual significance, connecting that family to *Ellarpak.*

All motifs are found near or along the rim of the sherd and the rim itself is often built in a bulging manner. Many of the symbols are only noted in one level of the excavation rather than multiple, except for the bulging underneath and on the rims and the single dots under the rim. The rim bulge could be structural rather than motif, however the bulge under the rim and the single dot underneath the rim may represent a family living in that space for multiple generations. Although the exact motifs changed over the occupation of the four units, the line-and-dot motif style is consistent.

Some of the pottery contains an extra outer layer constructed from a light brown clay and woven grass (Figure 8.10). I regarded the brown layer an extra layer rather than caused from burning or the color of the original clay, because it is composed of a different cortex than that of the grey pottery. The source of the brown outer layer is unknown, but the tight grass weaving and hard cortex suggests it is used to strengthen the brittle pottery. It may also be purely decorative. From the extensive information of pottery construction given by Harry and Frink 2009 there was no mention of this type of production mechanism (Harry and Frink 2008; Harry *et al*. 2009). The lack of ethnographic, oral sources and related archaeology on this, indicates a lack of information.

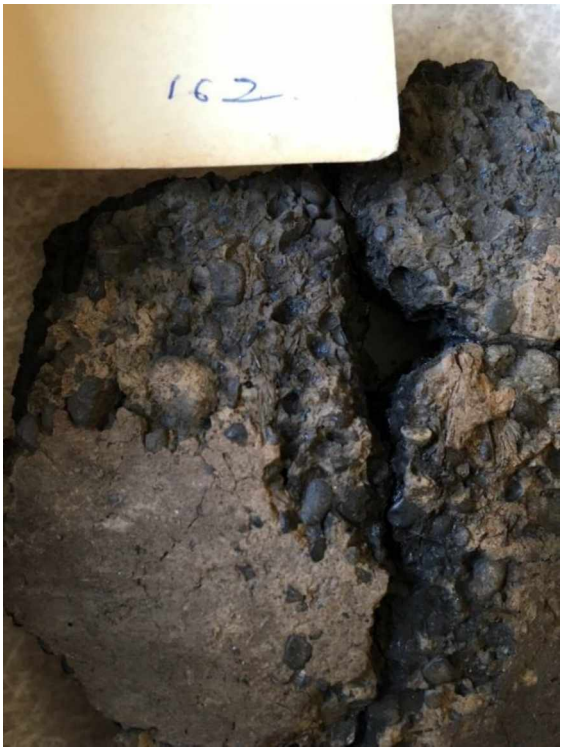

Figure 8.10 Pottery with Brown Matted Grass Layer. This image depicts a large pot composed of grey pottery with large pebbles and the outer brown layer with woven grass.

Figure 8.11 Pottery with Designs. This image depicts a pottery sherd with a grey cortex and three lines under the rim with parallel markings.

8.2 The Built Environment

The goal of this section is to interpret the systems of activities and settings within the built environment (Rapoport 1990) at the excavated occupation. To interpret the systems of activities and settings, this section explores household formation processes, the density results (Chapter Seven and Appendix A), the recovered artifacts (Kowta 1960) and the surface and wall profiles (Kowta 1963).

To distinguish activity areas, I first explored household formation processes. Household formation processes aid in interpreting which remains were excavated from primary and secondary contexts. Distinguishing between contexts is important to interpreting activity locals. Behavioral archaeologists, Vincent LaMotta and Michael Schiffer (1999), remind us that the household formation process is a product of the accretion and depletion in material remains as a part of the household cycle. The authors highlight two central themes in household formation processes: (1) there is not necessarily a one-to-one relationship between material remains found

in a structure and the activities that occurred there and (2) objects in the house are not likely to be deposited where they were used, rather, household deposits represent phases of that structure's life history. To understand the household formation process, the authors suggest forming a model to explore the timing of different types of cultural and noncultural formation in relation to the household's life stages. Life stages include habitation, abandonment and post-abandonment (LaMotta and Schiffer 1990).

For this project, I analyzed the built environment based on the model of a Yup'ik house in section 5.2.1. Section 5.2.1 explored the building, composition and activities associated with the *qasqi* [men's communal house] and the *ena* [family house]. Based on the Yup'ik household model, discarded materials were placed in a midden. The lack of weathering on the material remains (section 8.1) suggests that discarded objects were buried rapidly. Burying artifacts was important in keeping households and villages clean. Bones, in particular, were buried quickly to keep the village more attractive to animals (John 2003). Middens were created in old housepits and between houses, continually building the mound structure (Barnett 2018).

As part of the house cycle, structures constantly went through rebuilding phases, objects were cleaned and discarded, and new and refurbished materials were used as architecture. An Elder from southwest Alaska denotes that houses were fixed every year because of the permafrost's constant melting and refreezing phases (Fienup-Riordan 2007). Houses were refurbished with new and recycled materials; for example, archaeologists at Nunalleq (ancestral to Quinhagak) uncovered a *qayaq* [kayak] bow refurnished as a house beam (nunalleqworldpress.org). When the house cycle began, salvageable materials were taken from the old house, including objects and architecture, and placed in the new home. Once the house was demolished it was filled with midden material and was later excavated to host a new house.

As a result, the formation of a Yup'ik village archaeological assemblage includes secondary deposition of materials throughout the village, household depressions, primary deposition from artifacts left in households and refurbishment of older artifacts in later contexts. While the excavated assemblage at *Temyiq Tuyuryaq* is a mix of depositional processes, the profile and floor drawings aid in isolating these processes in each unit, separating primary and secondary depositional materials.

I separated primary and secondary fill by contexts including *de facto* refuse or midden materials closely related in time to the feature's occupation, such as, in the bottom of pit or house

feature. Aiding in feature identification is Kowta's (1963) three profile and two floor drawings featured in figures 8.12-8.16. Density maps from each excavated level were aligned with the drawings to assess depositional processes, features, and systems of activities and settings.

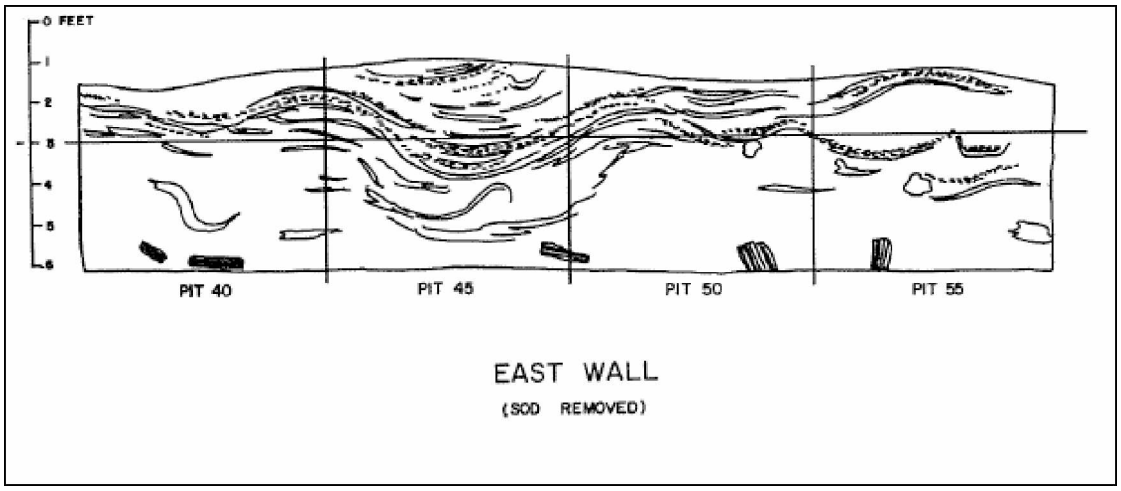

Figure 8.12 East Wall Profile. The image depicts a pit in unit 45 spanning multiple levels, a small storage pit in unit 55 and multiple logs along the bottom level. Kowta 1963 Figure 3 TA-IA Wall Profiles.

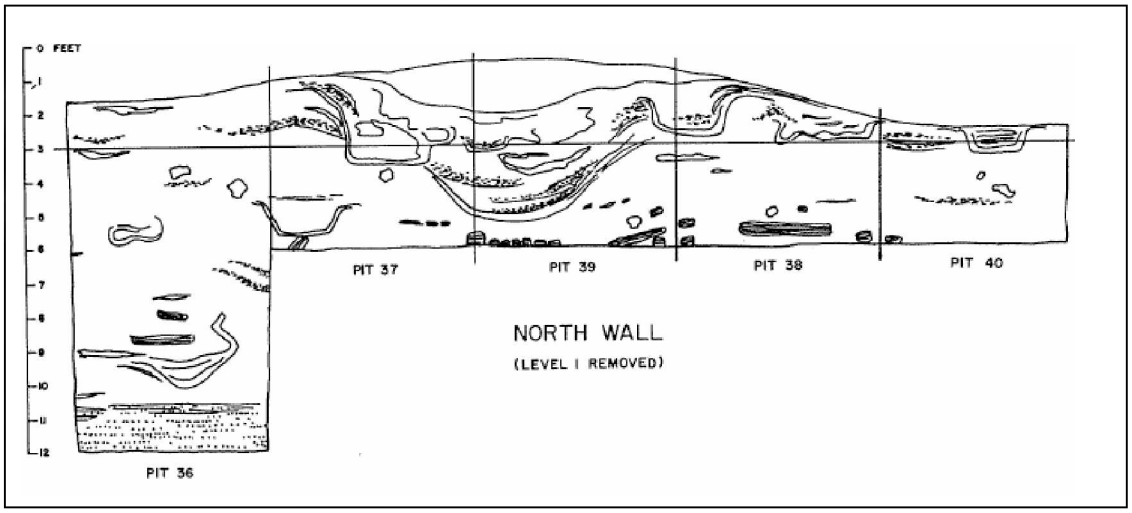

Figure 8.13 North Wall Profile. The image depicts a housepit-like structure with associated storage pits from unit 37 to 39 spanning multiple levels, as well as, a storage pit in unit 40 on the surface. Kowta 1963 Figure 3 TA-IA Wall Profiles.

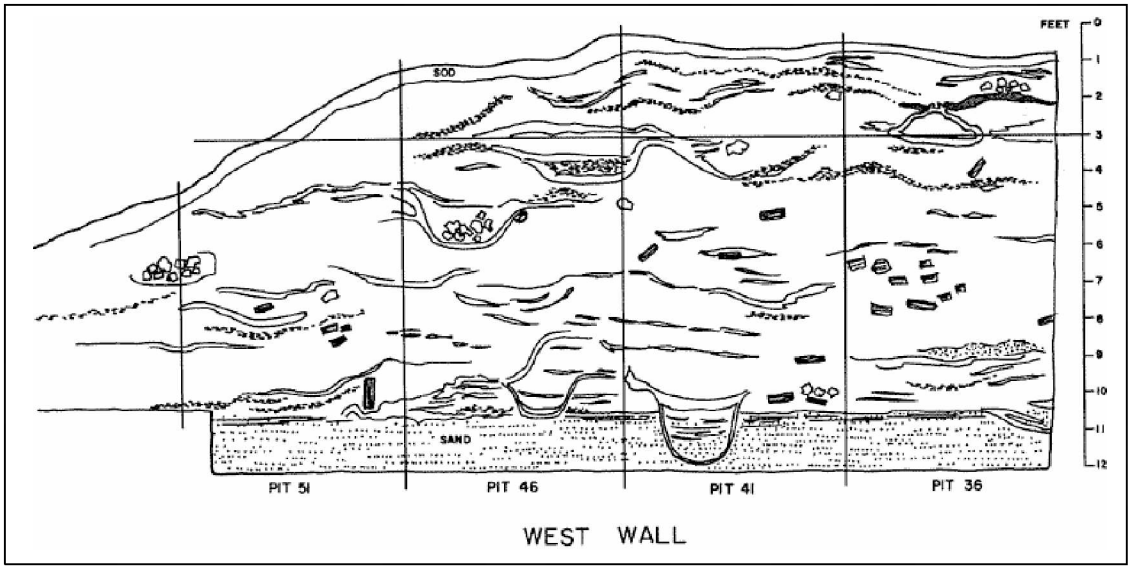

Figure 8.14 West Wall Profile. The image depicts multiple storage pits in units 41 and 46, as well as, layers of wood in multiple levels. Kowta 1963 Figure 3 TA-IA Wall Profiles.

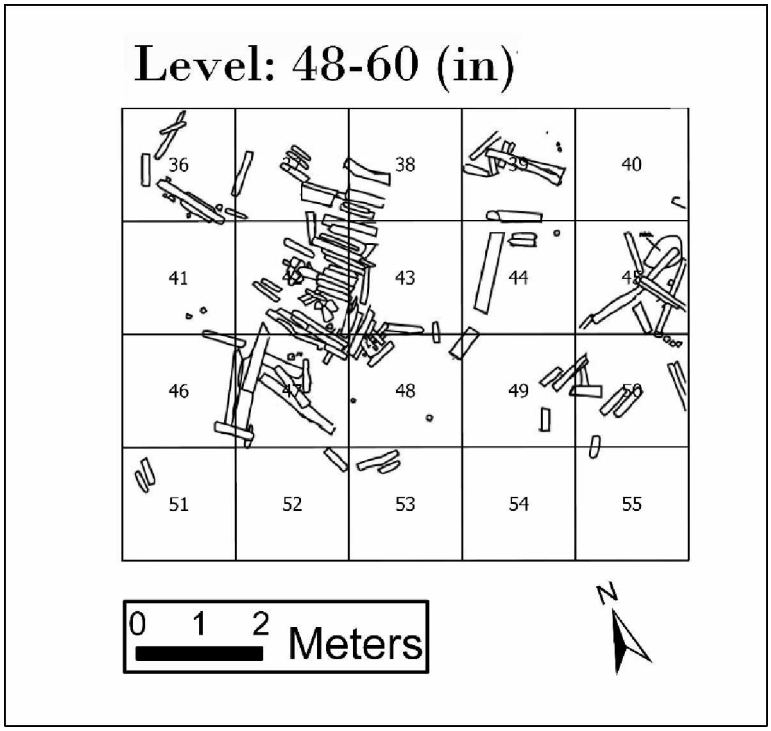

Figure 8.15 *Murak* [Wood] Layer Level 48-60 (in). The image depicts the *murak* [wood] deposits from level 48-60 (in). The shape indicates a housepit entrance. Kowta 1963 Figure 4 Distribution of Logs.

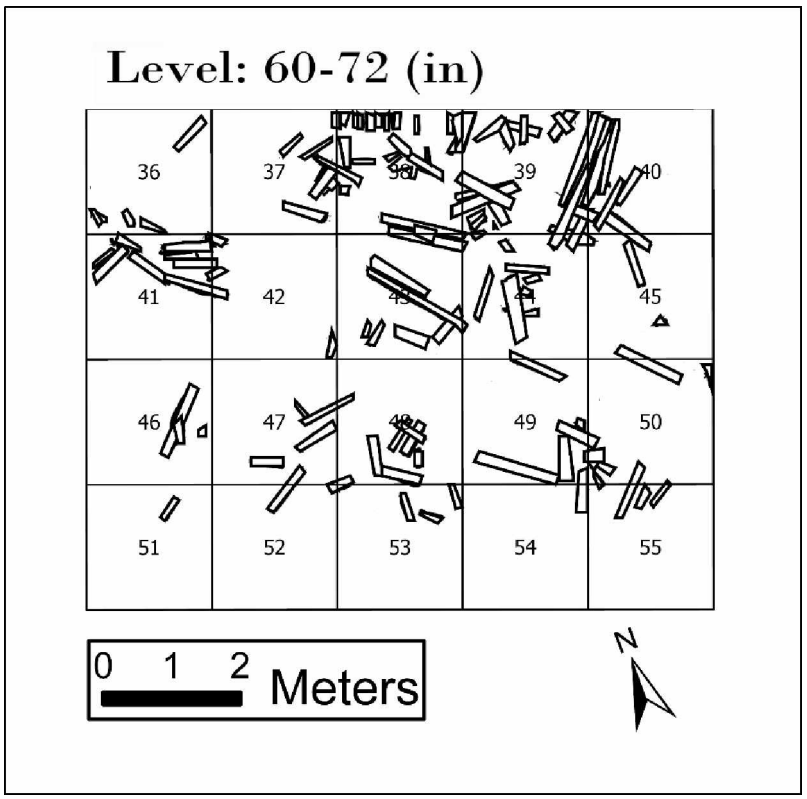

Figure 8.16 *Murak* [Wood] Layer Level 60-72 (in). Thick deposit of *murak* [wood]. Kowta 1963 Figure 4 Distribution of Logs.

8.2.1 Sod level

The sod level is an accumulation of post-colonial surface occupation. According to Kowta's (1963) surface map (figure 8.17) there is a large pit in the northeast corner, indicative of a sodhouse, most likely an *ena* [family house] because of its small size (Fienup-Riordan 2007; Frink 2016). The smaller impressions are housepits, exterior storage pits or excavated pits from subsistence diggers. The excavated materials from the sod level are associated with post-colonial seasonal cabins or tents, or middens from late village occupation. Because the move to *Nutaraq Tuyuryaq* [New Togiak] in the mid-1800's, the occupation of the old village was likely seasonal (Alix and Brewster 2004; Kowta 1963). Figure 8.18 demonstrates a photo from *Temyiq Tuyuryaq* in the late 1880's with cabins and above storage caches.

The tools from the sod level are primarily in the southern units including concentrations of slate and culturally modified faunal organics. The lack of *murak* [wood] suggests that there were no permeant structures at that time period or in that space. It also may indicate that the occupants removed the *murak* [wood] from the structures to be refurbished elsewhere.

The lack of structures and the presence of food production tools, cutting tools and hunting tools indicate the area was likely a multi-purpose camp location. Although permanent residency moved across the bay, villagers erected camps in the spring, summer and fall for fishing, mollusk gathering, collecting roe and greens, fowling and egg collection. The cannery, in use since 1844, would have also employed workers living in tents and cabins near the area. Multiple cabins are still owned and used occasionally by *Tuyuryaq* residents today. Old fish drying racks indicate camp locations for summer activities (Barnett 2018).

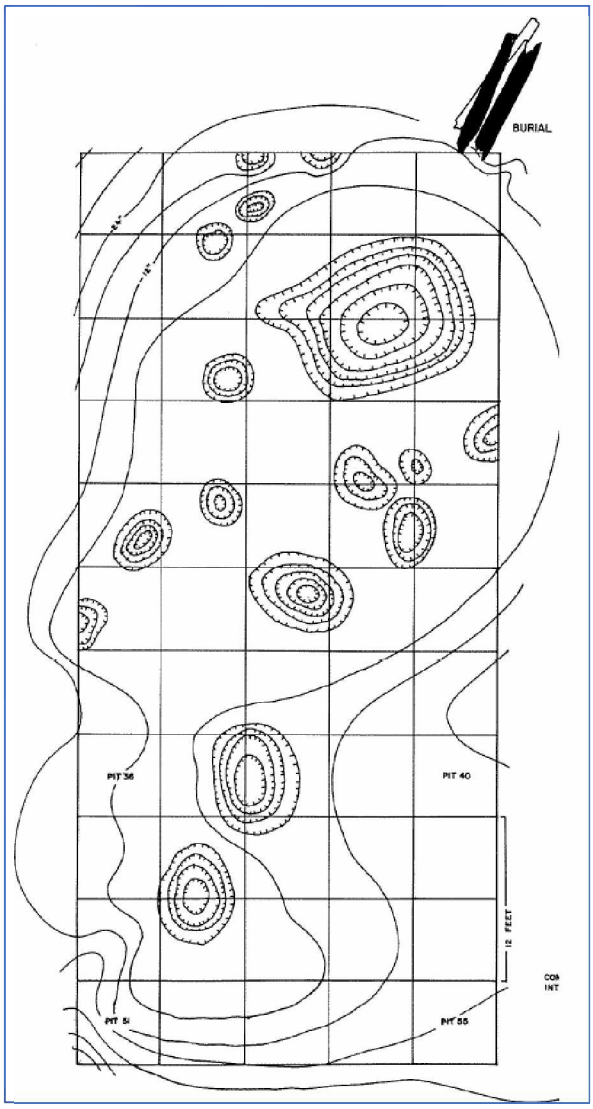

Figure 8.17 Surface Feature Map. Large pit in upper right side possibly an *ena* [family house]. Smaller pits could be houses, storage pits or subsistence digging. Kowta 1963 Figure 2 TA-IA Surface Features.

Figure 8.18 *Temyiq Tuyuryaq* late 1880's. Tents and raised caches. Photo courtesy of Togiak Traditional Council.

8.2.2 Level 0-12 (in)

Artifact concentrations from level 0-12 (in) are located in the mid-eastern units. The concentration of artifacts is located to the east of the featured pits illustrated in figure 8.19 and 8.20. Considering the concentration isn't associated with any surface features, the discernable eastern profile features, nor with any wooden materials, these cultural remains are likely fill material.

Artifacts include cutting, snow/ice removal, fishing, fishing/fowling, land hunting and stone working tools. Artifacts of low count spread throughout the occupation are likely fill. The fill includes food production (primarily pottery), clothing production, wedges/scrapers, cutting tools, fishing/fowling, and sea hunting equipment. Considering results from the culturally modified faunal organics in section 8.1, the fill material is more weathered than earlier occupations, thus artifacts were not being buried as rapidly. The slow accumulation of materials suggests that there wasn't a household or substantial occupation at the time period.

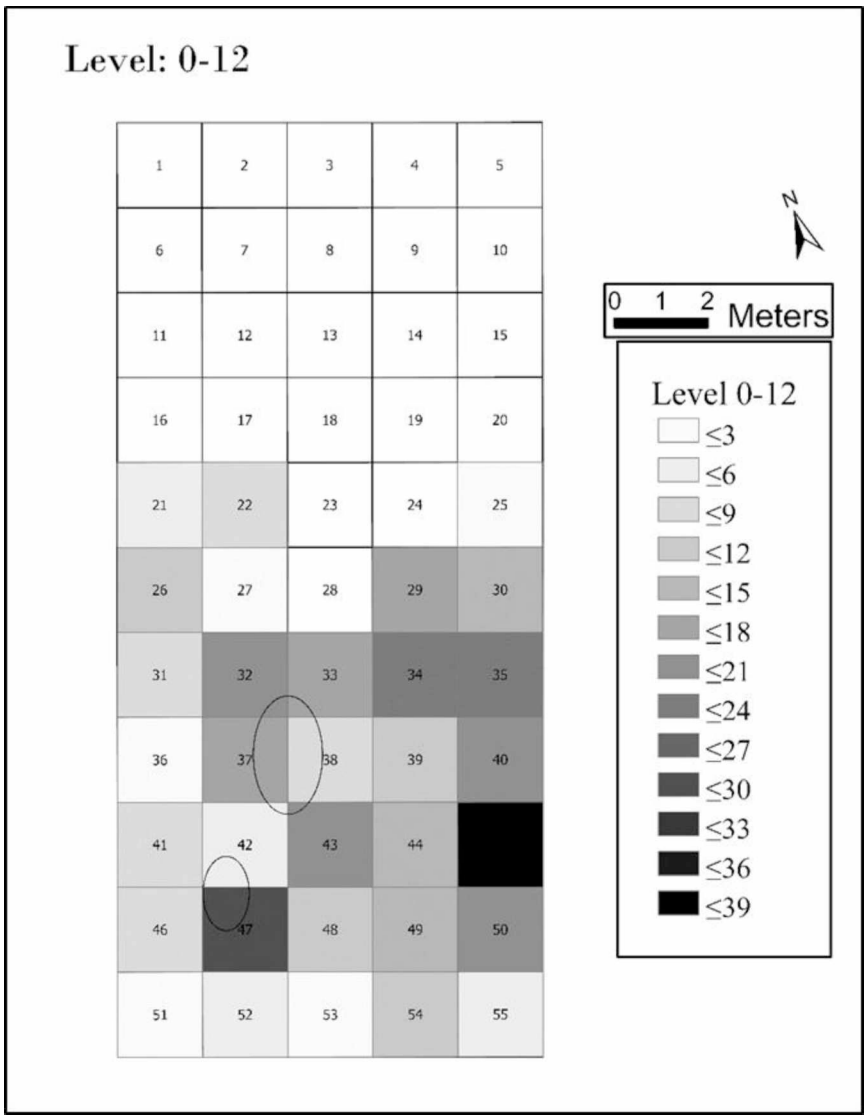

Figure 8.19 Level 0-12 (in) Total Artifact Count and Pits. The total count of artifacts from level 0-12 (in) with circles to illustrate the location of the pit features on the surface map. The densest concentration of artifacts is along the eastern wall and not associated directly with the pit features. Thus, the artifacts are likely fill material.

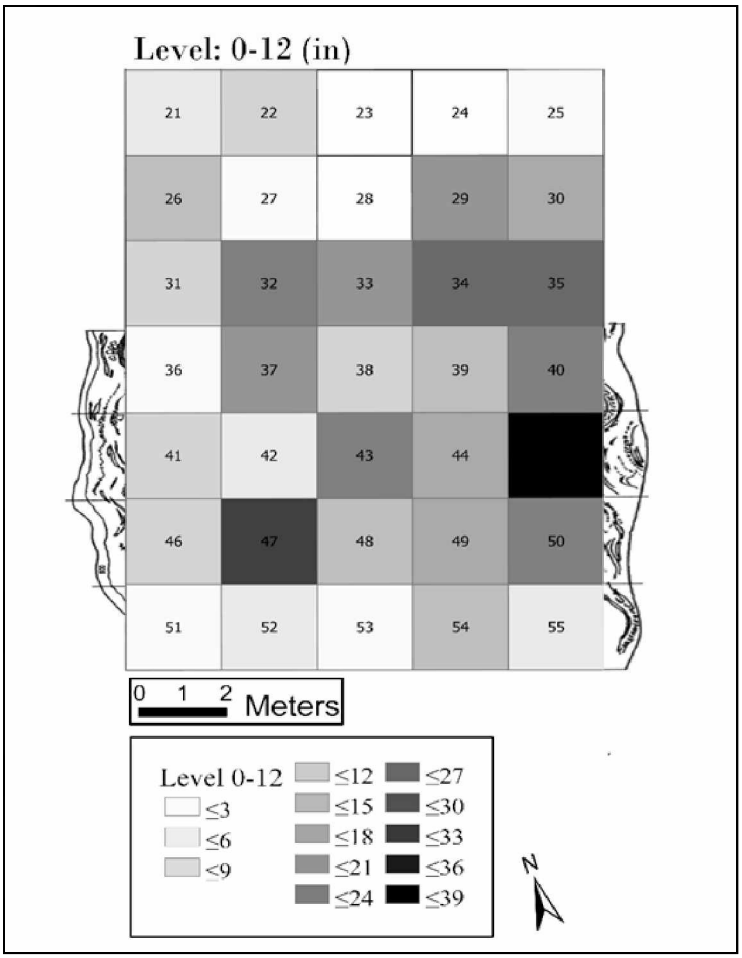

Figure 8.20 Level 0-12 (in) Total Artifact Count and Profile Drawings. The density model against the western and eastern wall profile for the level. There was no associated northern wall profile. The western and eastern wall profiles do not illustrate any discernable features.

8.2.3 Level 12-24 (in)

Figure 8.21 illustrates the total count of artifacts and the wall features from level 12-24 (in) (Kowta 1963). Along the northern wall there is a large pit associated with the surface pit in figures 8.17 and 8.19. While along the eastern wall concentrations of artifacts are nearing the bottom of another pit structure. The materials associated with the pit structures include high concentrations of culturally modified *teggalquq* [stone] and fauna. Along the eastern wall there are tools associated with activities including hide processing, stone working, wood/hide working, cutting, snow/ice removal, fishing and fishing/fowling. Along the northern wall there are high concentrations of tools associated with cutting, fishing/fowling, as well as, worked fauna and

slate. The concentrations of materials are similar to concentrations in level 0-12 (in) and potentially from midden materials.

Level 12-24 (in) is still situated in radiocarbon level 400-Modern cal BP and is the level with the artifact dating to 1104 cal BP in unit 41. The early date suggests that digging activities were occurring somewhere in the village and sediments were redeposited in and around unit 41. The other radiocarbon date in unit 46 at 506 cal BP is much younger than the date from unit 41, yet still older than the dates from the household structure in the lower level. The older date suggests that the area in and around unit 46 was also filled with material from across the site.

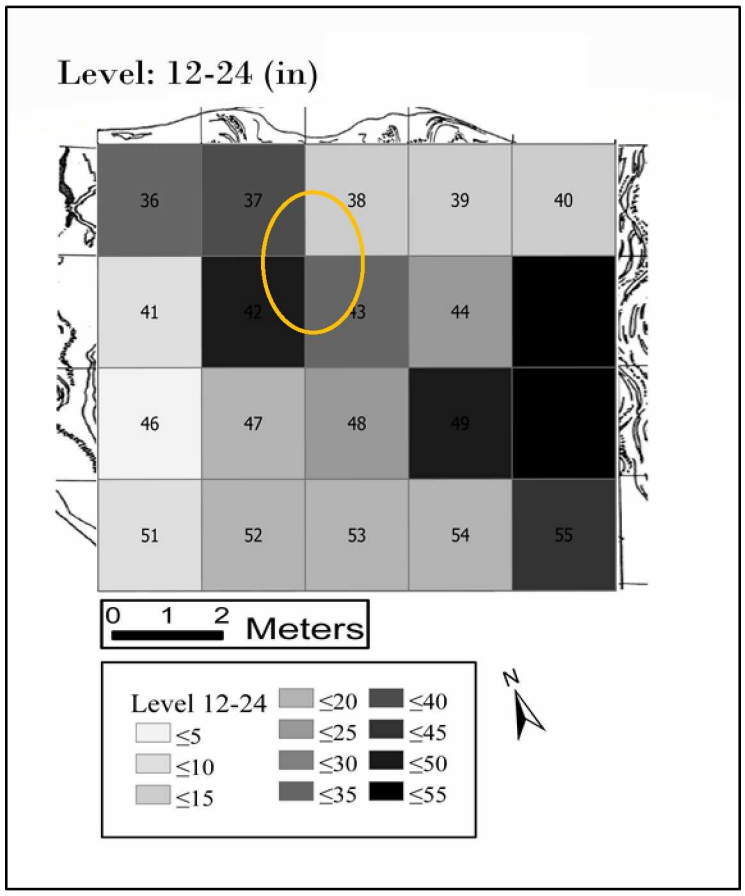

Figure 8.21 Level 12-24 (in) Total Artifact Count and Profile Drawings. The density of artifacts from level 12-24 (in) with the eastern, northern and western profile walls. Circle indicating surface depression. In the western profile there is a small storage pit feature above unit 50, and in the northern wall there is the continuation of the pit from the surface. The concentration of artifacts is associated with the storage pit in unit 50.

8.2.4 Level 24-36 (in)

Level 24-36 (in) contains the bottom of a storage pit on the eastern wall in unit 50. The northern pit feature also begins to form, and multiple lined-storage features are uncovered. Near the northern pit, the densest artifact concentration is in unit 42. It is difficult to distinguish in Figure 8.22, but the profile closest to unit 37 contains a storage pit feature, as well as, a sandy surface feature, suggesting that unit 37 and surrounding units are associated with the pit feature and housepit-like structure. In the north profile, behind unit 38 and 39, is another lined-pit feature. There is a lined-pit feature in unit 40. On the western wall behind 41/46 and on the eastern wall behind unit 55 are two more lined storage pits. The increase in features, the end of the pit on the eastern wall and the multiple sandy occupation surfaces, suggest that the fill gives way to a punctuated occupation surface.

Concentrations of culturally modified slate, fauna, and *murak* [wood] surround the end of the pit feature on the eastern profile, the sandy surface and pit above unit 37. Dense deposits of artifacts near these features include shafts, food production and storage, and wood/hide processing tools. It is also the first level woven grass is found near the northern storage pits in units 39,44 and 45, in addition to, a piece of hide found in unit 44. Other materials like ornamentation, community tools and children's toys also became more prevalent and are located near to the northern wall, illustrated in Figures 8.23 and 8.24. Continued artifacts include pottery, cutting tools, wood/hide production, hide processing, fishing/fowling and land and sea hunting. Furthermore, the fishing and hunting tools are primarily located in the southern units, away from the pit structure. This level is still also situated in radiocarbon level 400-Modern cal BP.

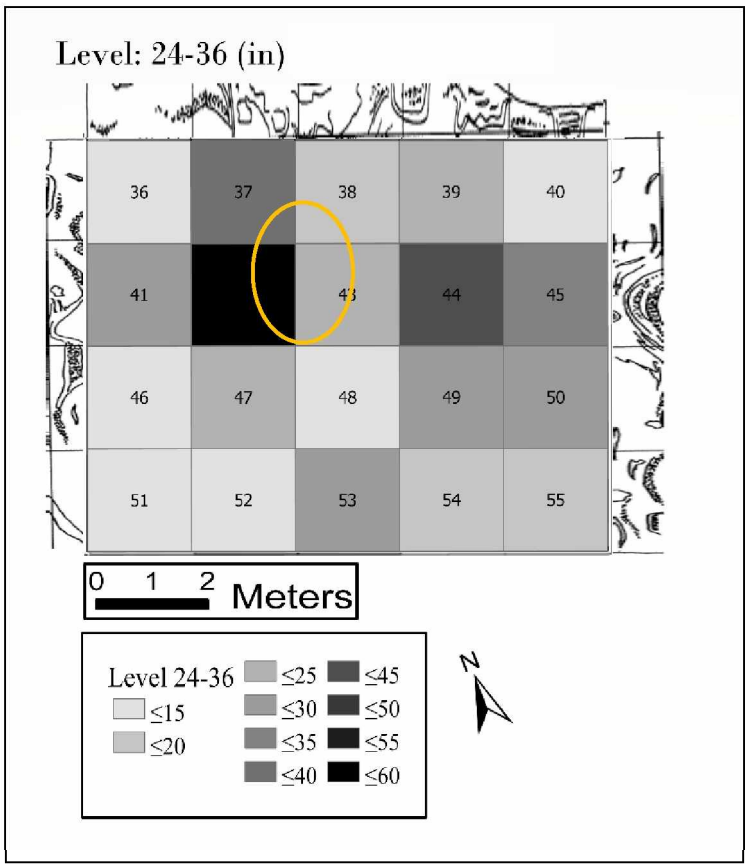

Figure 8.22 Level 24-36 (in) Total Artifact Count and Profile Drawing. The total count of artifacts and the eastern, northern and western wall profiles. Circle indicating surface depression. The densest concentration is in unit 42 associated with the large pit feature in the northern wall.

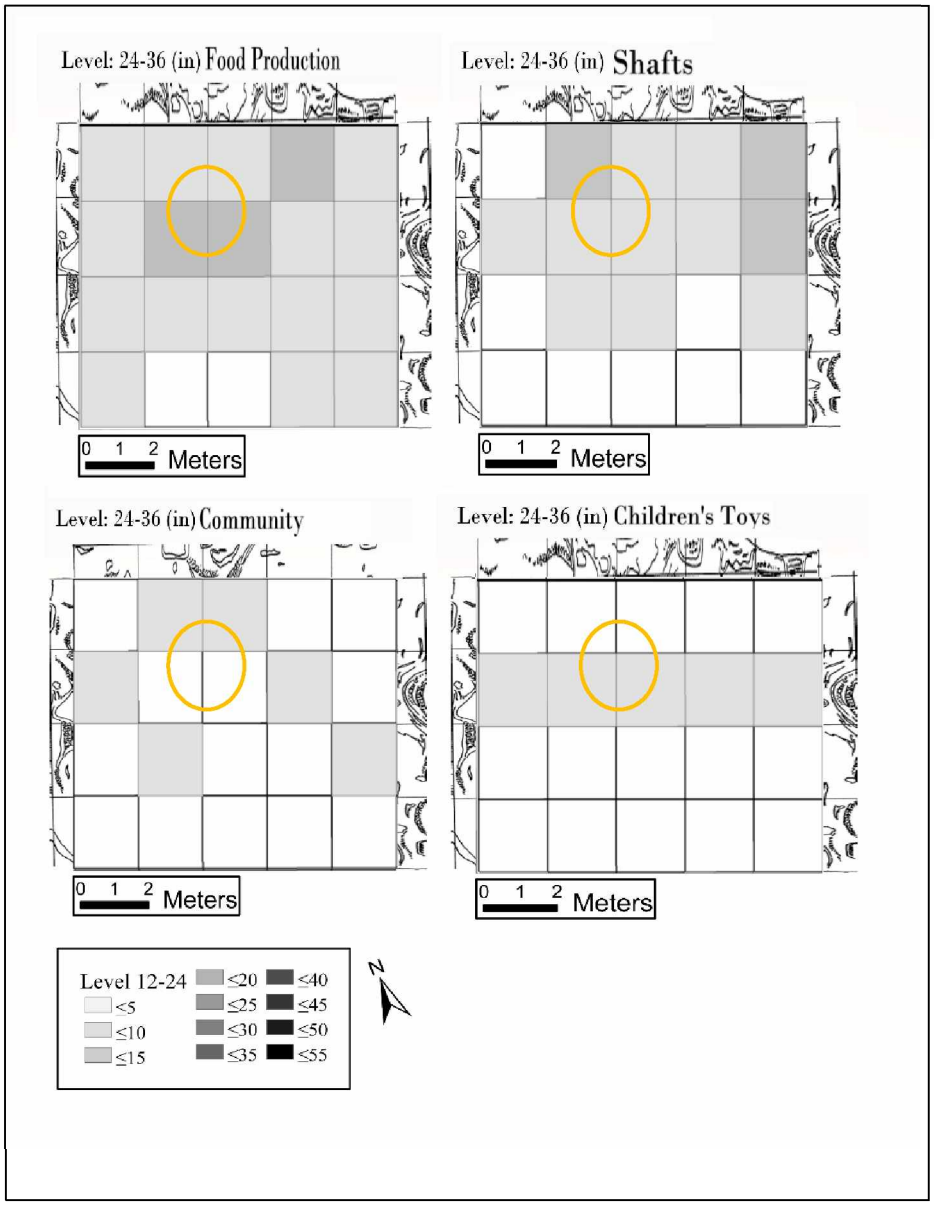

Figure 8.23 Level 24-36 (in) Food, Shafts, Community Tools and Children's Toys. There are four concentrations of artifacts, in addition to, tools not found in the previous levels like community tools and children's toys. Circles indicating surface depression. The concentration of artifacts is associated with the pit features in the northern and eastern profiles.

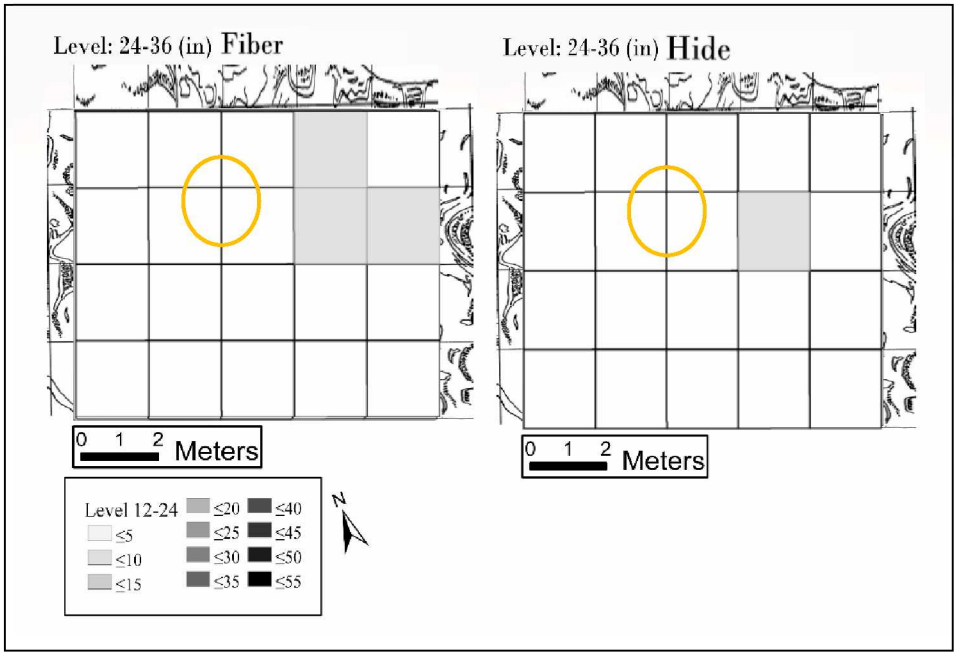

Figure 8.24 Level 24-36 (in) Fiber (Woven Grass) and Hide. There are artifacts not found in the previous levels like fiber and hide. Circle indicate surface depression. The fiber and hide remains found in association to the pits in the northern and eastern profile walls.

8.2.5 Level 36-48 (in)

Level 36-48 (in) contains the bottom of the potential occupation level in the housepit-like structure (northern profile), as well as, the bottom of the storage pit above unit 37 and the very bottom of a storage pit in unit 40 depicted in Figure 8.25. Along the western wall is the bottom of a storage pit above unit 46. The densest concentration of artifacts occurs in unit 55 along the eastern wall. There is nothing in the wall denoting the presence of such a dense layer, so it is possibly midden material.

Discounting the pottery, which is likely midden, food production tools are concentrated in the possible occupation of the housepit-like structure including wooden vessels, cutting boards, and eating utensils, illustrated in Figure 8.26. Also discounting the pottery, storage equipment includes baskets and wooden vessels accumulated near the housepit structure. In lower numbers, but also located near to the housepit, are fiber materials, whetstones, hammerstones, hide processing equipment and stone working equipment. In unit 40, the end of the lined-storage pit, there is a concentration of wooden artifacts including shafts. Also found are children's toys and fishing/fowling equipment. Artifacts spread throughout the excavation includes pottery, whetstones, hammerstones, hide processing, cutting tools, fishing and fowling

equipment, and land/sea hunting. The tools used for midden material are similar to the first three levels. In addition to these tools, community tools and travel equipment are also spread throughout the excavation.

Of the tools recovered, the only remain associated with the sandy level of the possible housepit are food production/storage, few stone working materials and few of the fishing/fowling and hunting tools. The remaining tools are spread throughout the excavated area, the highest abundance in the southeast and northeast corner. The northeastern corner is associated with the bottom of a storage pit, with an abundance of shaft fragments and fishing equipment.

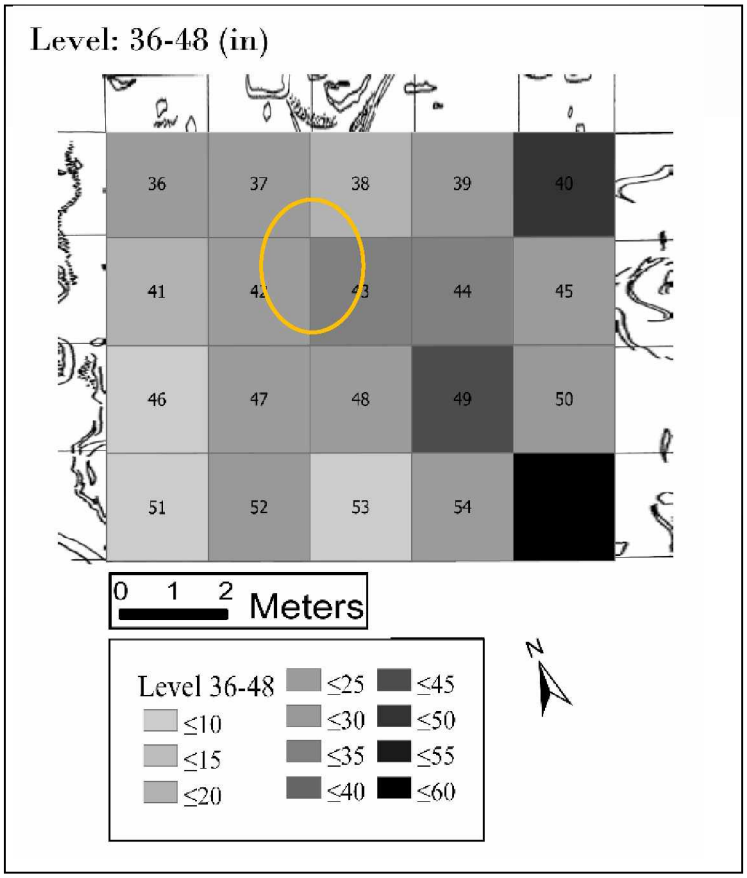

Figure 8.25 Level 36-48 (in) Total Artifact Count and Profile Drawing. The total count of artifacts and the eastern, northern and western wall profiles. Circle indicates surface depression. The densest layer of artifacts is in unit 55 near no known feature.

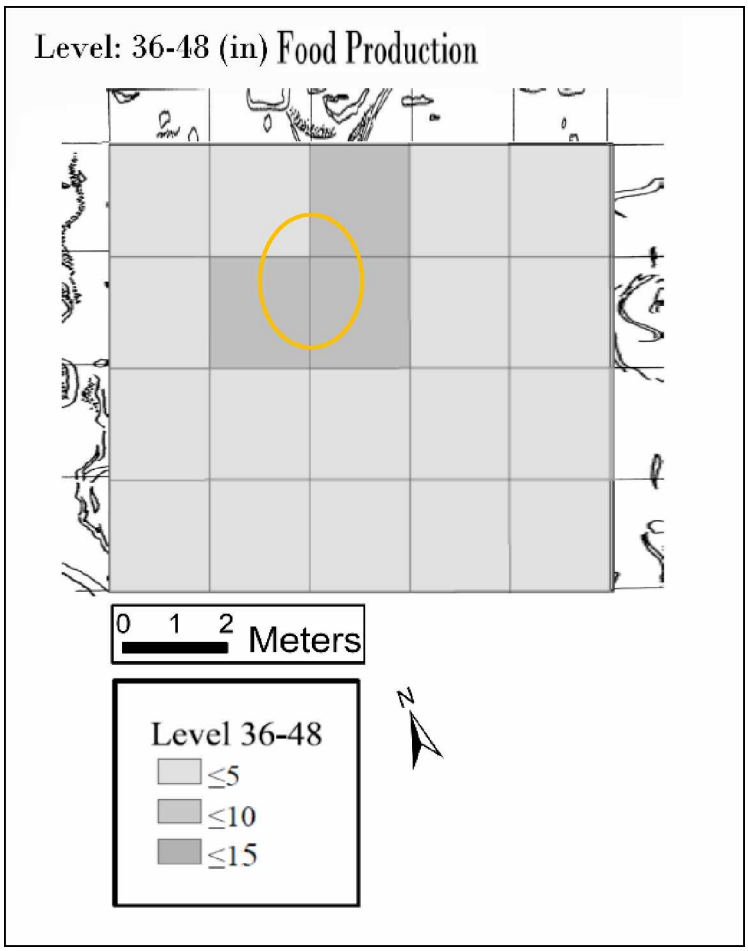

Figure 8.26 Level 36-48 (in) Food Production. The concentration of food production tools at the bottom of the housepit structure. Circle indicates surface depression, which maybe the top of housepit structure.

8.2.6 Level 48-60 (in)

Level 48-60 (in) contains a dense layer of *murak* [wood] associated with the bottom of the housepit structure found in Figure 8.28. Figure 8.29 illustrates the *murak* [wood] remains located on the level's bottom, forming a tunnel-like feature leading to the housepit. There is also a storage pit located along the western wall profile above unit 46.

In addition to the storage pit along the western wall, there is an accumulation of artifacts over unit 48. The artifact accumulation is located next to the tunnel-like feature, on top of wooden boards, potentially indicating a storage or tunnel cooking location. Yup'ik communities used tunnels for storage, cooking and as a house for the dogs in the winter (see example in Figure 8.27) (Fienup-Riordan 2007; Frink 2016). The accumulation of materials on the wooden frame suggests that the location was used as a cooking or storage area. The materials

accumulated in this unit include wooden vessels, serving utensils and pottery, storage materials (vessels and pottery), and cutting tools (blades and *uluaq* [ulus]), as well as, five or less shafts, wood/hide processing tools, children's toys, community tools (primarily fire-making equipment), travel, snow/ice removal, fishing, fishing/fowling, hunting-sea and stone working (Figure 8.30).

Along the bottom of the housepit-like feature there is a lack of accumulation, setting the feature apart from other areas of the excavation. Artifacts located in the units include fiber materials, whetstones, shafts, hide processing equipment, hammerstones, wood/hide processing, food production, community tools, travel tools, snow removal and fishing/hunting tools. All the tools occur in low counts (less than five). The storage pit along the western profile contains low counts of worked fauna and slate tools, some hunting and fishing equipment, community tools, pottery, wedges and shafts. There is a concentration of worked fauna, slate and shafts, unlike other areas of the excavation.

Along the tunnel structure there are dense concentrations of cutting tools, travel equipment (broken and likely refurbished for another purpose), food production and storage. Fiber is not found in high concentrations but is almost exclusively located in the tunnel structure. Another intriguing feature is the accumulation of wood in unit 39 which contains a concentration of cooking tools, suggesting that the tunnel was used for cooking/storage activities and perhaps led to an exterior cooking room.

The combination of the materials concentrated on the first occupation of the housepit-like structure and the tunnel to the structure suggests that the feature is a housepit. The size of the pit from the surface spanned almost two meters, suggesting it is small house, probably an *ena* [family house]. Other components also suggest the structure is an *ena* [family house] including the location of the storage pits along the sides of the structure. *Eniit* [plural] were built with four posts and a wall that leaned towards the posts, in between the wall and the posts were clay-lined storage pits used for storing food and tools. The leaning of the house frame is illustrated in Figure 8.27. The northern wall profile indicates pits on the edge and connected to the houspit, as well as, around the pit during the first occupation. In addition to the pits, located most abundantly on the floors of the occupation level and of the tunnel are cooking and storage equipment, suggesting that the primary activity occurring in the area was food production and storage. The wood and artifact accumulations along the tunnel also suggest that there was an extra room connected to the tunnel for the purpose of cooking and storage.

Figure 8.27 Example of the Ena [Family House] Construction. Image from Martin Family Collection, Kwigillingok, 1931, Anchorage Museum B07.5-B3, found in Fienup-Riordan 2007. Image demonstrates the leaning of the sod house frame, making room for storage pits and raised benches on the sides of the house.

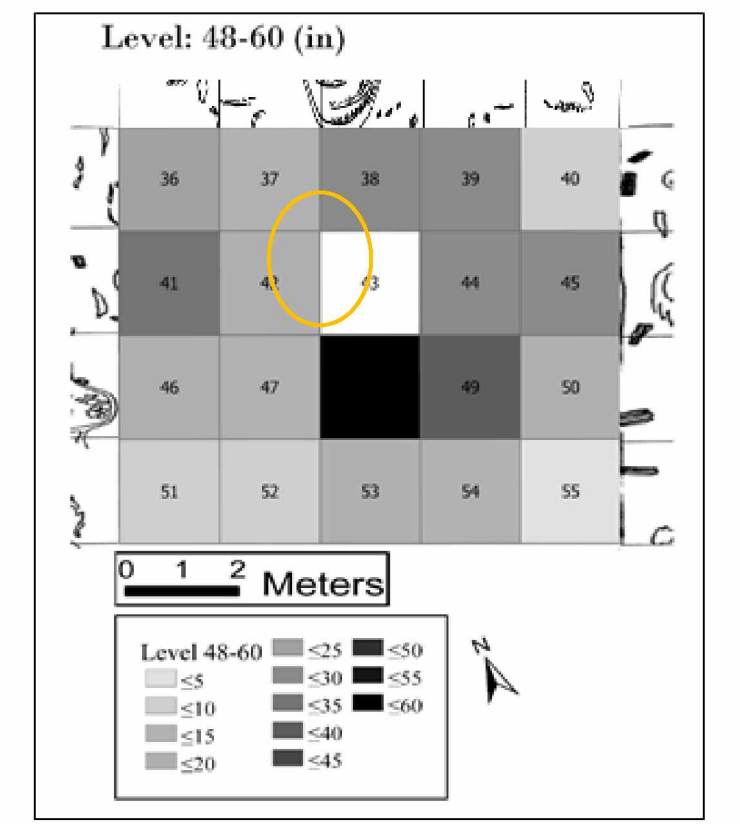

Figure 8.28 Level 48-60 (in) Total Artifact Count and Profile Drawings. The total count of artifacts and the eastern, northern and western wall profiles. Circle indicates surface depression which maybe the top of housepit structure. The densest concentration of artifacts is in unit 48 along the tunnel-like floor. Unit 43 is empty of materials for unknown reasons.

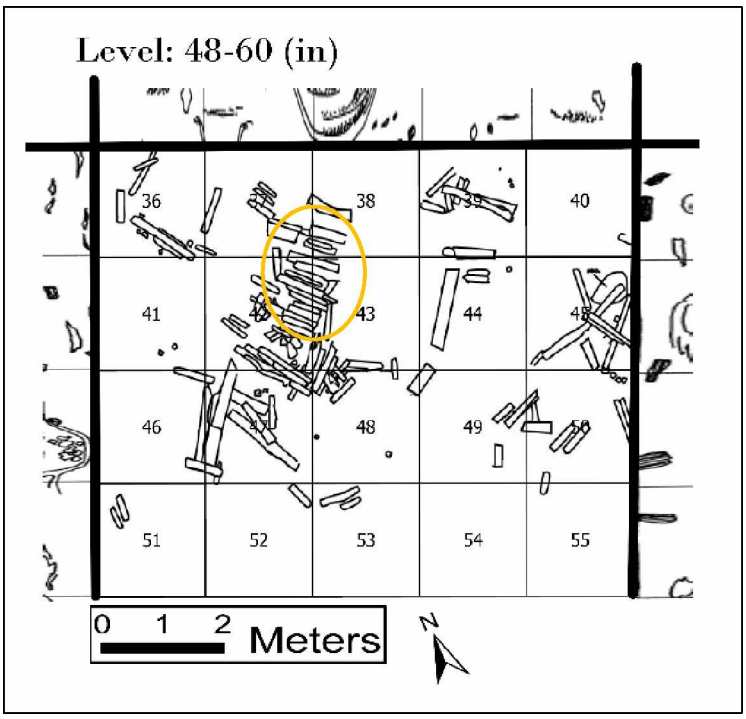

Figure 8.29 Level 48-60 (in) Wood Layer. The tunnel structure on the bottom of level 48-60 (in) leading to the housepit in the northern profile wall. The circle indicates surface depression which maybe the top of housepit structure.

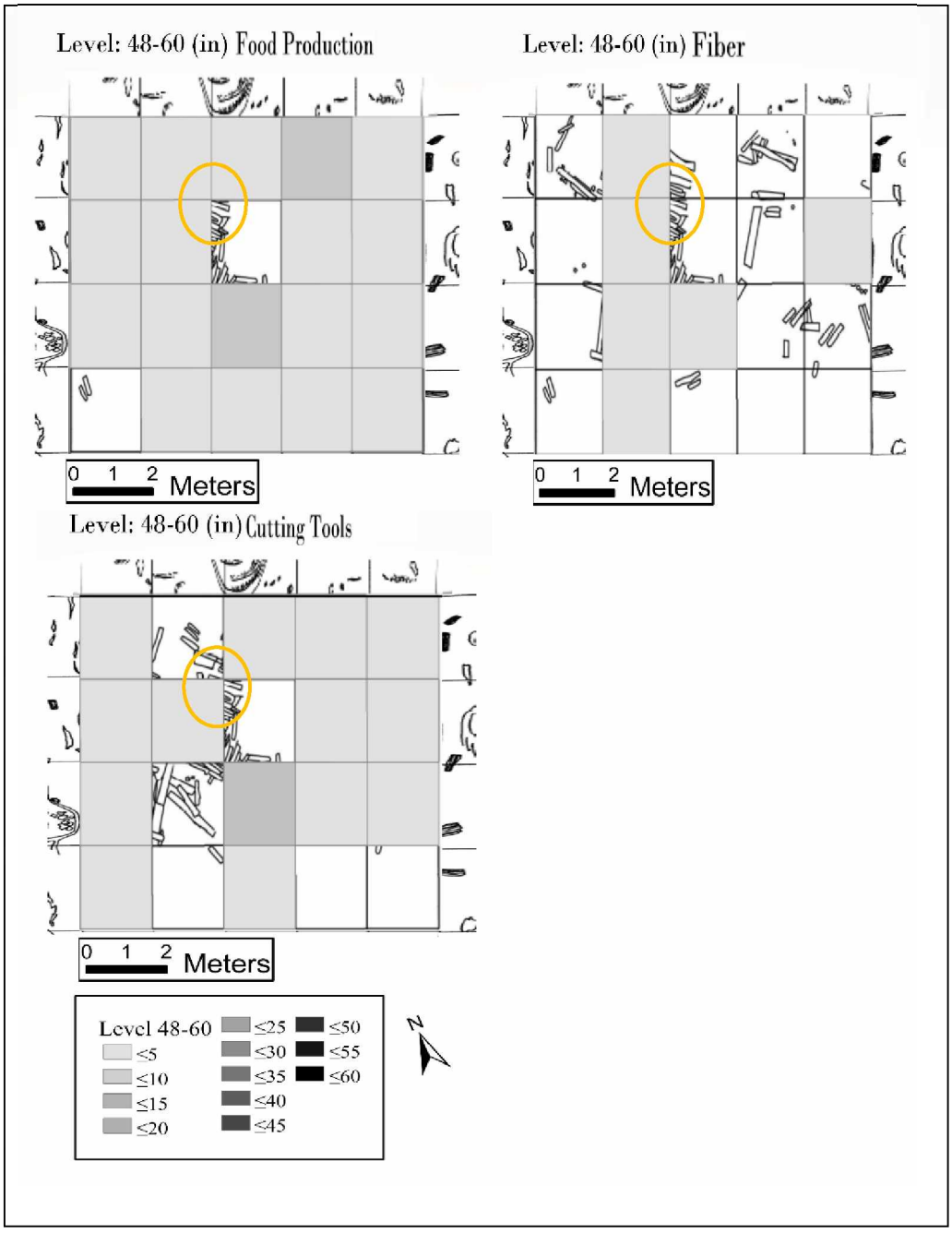

Figure 8.30 Level 48-60 (in) Food production, Fiber and Cutting Tools. Concentration of artifacts along the tunnel structure. The circles indicate the surface depression which maybe the top of the housepit structure. Food production tools are concentrated near the bottom of the housepit and in the exterior room on the tunnel, fiber is almost exclusively located in the tunnel and cutting tools are concentrated in the exterior room of the tunnel.

8.2.7 Level 60-72 in

The wood located on the bottom of level 60-72 (in) accumulates in the northeastern corner of the excavated area. Along the top of units 37 and 38 there also is a tunnel-like

structure, while in unit 40 there are large boards lined next to each other in a floor-like or tunnel-like structure as seen in Figure 8.32.

Relative to the total count of artifacts, level 60-72 (in) contains high concentrations of whetstones, shafts, wood/hide processing materials, food production, travel and cutting tools. Also recovered in high abundance are fiber materials, hide processing tools, community objects, children's toys and hunting tools. Although there are tools spread throughout the excavated area, there is a higher concentration of materials recovered in the northwestern corner above the dense wood remains. Materials in the corner include whetstones, shafts, food production/storage, travel materials, fiber materials, children's toys, one recovered ornament, and fishing/fowling tools. The rest of the materials are found within the northeastern units and spread throughout the excavation. The dense materials and wooden boards suggest that there was a house in the northwestern corner.

The layer of wood along the west profile above unit 41 contained a wedge chosen for radiocarbon dating. The wedge was calibrated to 544 cal BP, 100 years younger than the first occupation level from the housepit. Suggesting that the house was built and used for 100 years from the bottom to the last occupation level.

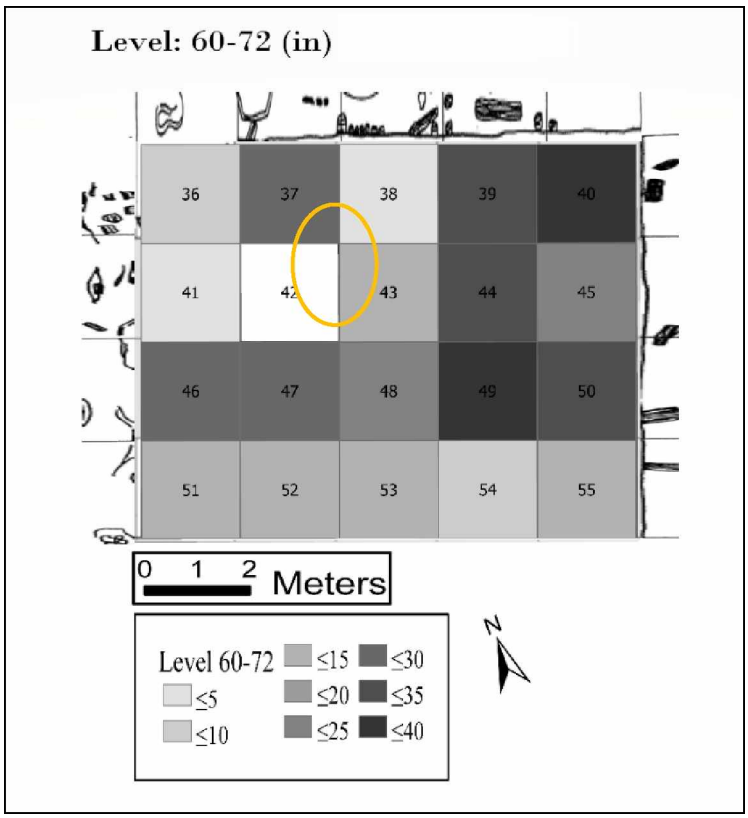

Figure 8.31 Level 60-72 (in) Total Artifact Count and Profile Drawings. The total count of artifacts and the eastern, northern and western wall profiles. The circle indicates the surface depression which maybe the top of the housepit structure. The densest concentration of artifacts is along the eastern profile wall. The eastern excavated area also contains wood layers and a potential occupation level.

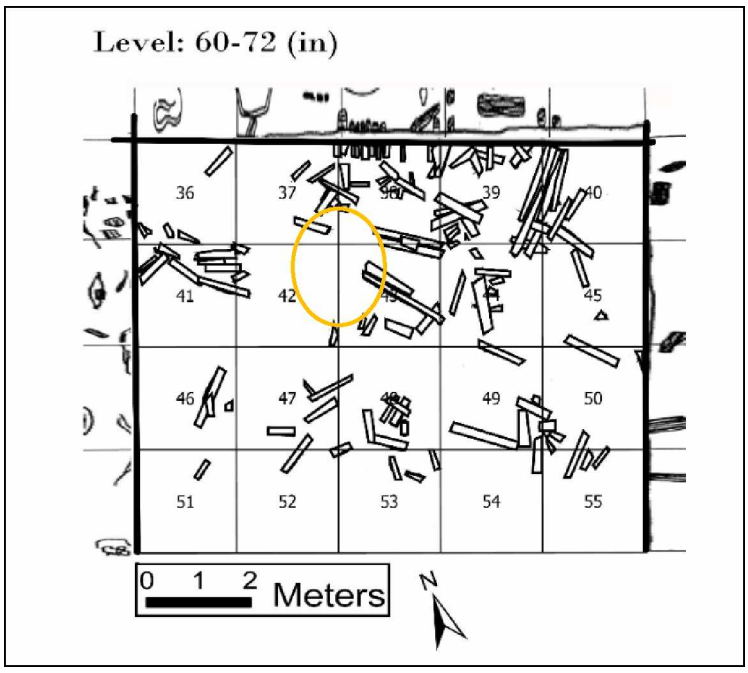

Figure 8.32 Level 60-72 (in) Wood Layer and Profile Drawings. There is an accumulation of wood in the northeastern corner of the excavation, in addition to, a tunnel and housepit feature along the northern wall. The circle indicates the surface depression which may be the housepit feature.

8.2.8 Level 72-84 (in) through 120-132 (in)

The following levels only consist of four units: 36, 41, 46 and 51. All the levels have low concentrations of artifacts. The lack of information and material made interpretation difficult. Thus, level 72-84 (in) through level 120-132 (in) were not considered further.

8.2.13 Further Discussion of the Built Environment

The lack of information retained from the excavation makes interpretation of the build environment difficult (Kowta 1963). The lack of information also strains the interpretation of the activity systems. Although materials are abundant throughout the excavation, the actual activities likely occurred elsewhere at the site. The material remains point to an abundance of food production, fishing/fowling activities, hunting, wood/stone/bone working, ice and snow removal and traveling events. Less abundant activities include community work (fire starting, water getting), child's play, and hide processing, which are all activities likely found throughout a Yup'ik village.

While the materials are primarily fill, there are some anomalies suggesting activities occurring in a house. The housepit along the northern profile is likely an *ena* [family house] ranging from levels 12-24 (in) to 60-72 (in). A radiocarbon date from the storage pit, associated with the occupation level of the *ena* [family house], is calibrated to 458 cal BP, while the date associated with the thick deposits of wood underneath the *ena* [family house] is 544 cal BP. The dates suggest that the household was occupied for 100 years.

The excavated materials, near the occupation level of the *ena* [family house], include cooking and storage objects. Traditionally, cooking vessels and utensils belonged to individual women and hung on the walls or on shelves (Fienup-Riordan 2007). From the excavated materials near the tunnel, there are tools suggesting storage, cooking and cutting activities were occurring, as well as, stone and bone working. Alongside the tunnel there is an extra layer of wood indicative of an extra room and this is interpreted as a storage or cooking space. Materials found in the extra space indicate processing, cooking and cutting activities were occurring.

8.3 Change and Continuity During the Little Ice Age

The final goal of this research is to explore the change and/or continuity of the artifacts and built environment throughout the Little Ice Age. The Little Ice Age significantly cooled southern Alaska, expanding the glaciers, sea ice and attracting salmon and sea mammals to the cold waters (Crowell and Howell 2013; Lawson *et al* 2010 Mason *et al*. 2019). The Little Ice Age was a period of punctuated cooling occurring in the northern hemisphere beginning circa 500 BP, peaking in 350 BP and ending 200 BP/150 BP (Bradley and Jones 1993; D'Arrigo and Jacoby 1992; D'Arrigo *et al*. 2005; Lawson *et al*. 2010 Mann *et al*. 2002).

Slate is the only culturally modified *teggalquq* [stone] raw material with a mean statistically different from during/after the Little Ice Age to before the Little Ice Age. Suggesting that slate tools were being used more regularly during/after the Little Ice Age, expanding the blade, cutting and hunting tool industries. Whereas, during/before the Little Ice Age there was a wider variety of tools ulitized.

The *teggalquq* [stone] colors, black and marbled grey and black, also have means significantly different from during/after to before the Little Ice Age. Black tools are used significantly more during/after the Little Ice Age than before, while marbled grey and black are only used before the Little Ice Age. *Ulukaq* [black slate material] is also used significantly more

during/after the Little Ice Age than before. This suggests that the dark slate found near *Tuyuryaq* was used more abundantly after 500 cal BP. Implying that the material became more preferred for making tools in later occupations or that the excavated area became an area for the production and discard of more slate tools. Blade tools, hunting tools and *uluaq* [ulus] all were composed equally of *uluakaq* [black slate material] throughout the entire occupation, implying that the cutting and processing industries expanded during/after the Little Ice Age. The lack of marbled grey and black materials during/after the Little Ice Age also suggests that the black slate or *uluakaq* [black slate material] from the *Tuyuyraq* area became more popular.

Of the ground slate production, only stage two slate have a statistically different mean from before to during/after the Little Ice Age. There are more stage two tools during/after the Little Ice Age than before, suggesting that the area's activity usage changed to a production location rather than a midden. The increased production of tools coincides with the occupation of the ena [family house] and is indicative of an occupied landscape rather than a fill location.

Snapping is the only production mechanism with a mean statistically different from during/after to before the Little Ice Age. Snapped tools are found abundantly during/after the Little Ice Age, suggesting that snapping slate was more prevalent in the later occupation. Also indicative of the housepit occupation.

Of the culturally modified fauna, the mean of *asveq* [walrus (*Odobenus rosmarus*)] is statistically different from during/after to before the Little Ice Age. *Asveq* [walrus (*Odobenus rosmarus*)] is utilized more intensely before the Little Ice Age than after, while *tuntu* [caribou (*Rangifer tarandus*)] is used at a higher rate throughout the entire occupation. This suggests that there was a decline in the *asveq* [walrus (*Odobenus rosmarus*)] population, that *asveq* [walrus (*Odobenus rosmarus*)] became unpopular to hunt or that the hunted remains were less often made into tools after 500 cal BP.

The antler, antler beams, and rib elements are also significantly different from during/after to before the Little Ice Age. Antler is employed more regularly during/after the Little Ice Age, while before there is a wider range of tools used. However, the antler elements including beams, pedicle/beams and tines all have greater mean values before the Little Ice Age. The rib also has a mean statistically different from after to before/during the little ice. This likely indicates a lack of sample size.

Weathering stage one and four have significantly different means, stage one having a greater mean during/after the Little Ice Age than before, while stage four's mean was greater before the Little Ice Age. It is apparent from assessing the tools that there is a point during the middle occupation where tools appeared unweathered or only slightly weathered. As previously discussed, the lack of weathering likely indicates that tools were buried in middens during the earlier occupation rather than left exposed for longer as in the later occupations.

None of the production mechanisms were different from during/after the Little Ice Age than before, suggesting the mechanisms of tool production was continual during the entire occupation. The means of tool seasonality also are not statistically significant from during/after the before The Little Ice Age, suggesting that the climate change didn't alter the use of these tools during their allocated seasons.

Of the culturally modified *murak* [wood], diagonal grain direction has a mean significantly different from during/after to before The Little Ice Age, potentially indicating a lack of sample size. Conifer tree use significantly increased during/after the Little Ice Age, suggesting that the use of coniferous trees increased in the later occupation and were used more often in the production of tools. Thus, more *tep'at* [driftwood] was collected on Yukon-Kuskokwim side of the bay and from the islands surrounding the bay during the later occupation, collaborating with stories from *Tuyuryaq* residents who claim the move to *Nutaraq Tuyuryaq* [New Togiak] was due to loss of driftwood at *Temyiq Tuyuryaq* (Alix and Wheeler 2004; Barnett, personal comm. June 2018). As the coniferous *tep'at* [driftwood] became more abundant, people moved to the other side of the bay in order to be closer to the Yukon-Kuskokwim collection location.

The summer and fall use of culturally modified *murak* [wood] tools are significantly different from during/after the Little Ice Age than before. Culturally modified *murak* [wood] used in the summer and fall are found more abundantly than during/after the Little Ice Age, suggesting that during/after the Little Ice Age the focus of the hunting tools shifted to winter and spring hunting. It also may indicate that the discard location changed over the occupation of the analyzed area.

Of the pottery, the use of pebbles as temper material significantly increased during/after the Little Ice Age, while the use of pebbles/shell/grass was used significantly less. Suggesting that the variety of temper materials lessens during the Little Ice Age. The vessels colored black-grey also significantly increase during/after the Little Ice Age, while those with black-brown

significantly decrease. Suggesting that the use of the brown-outer layers decreased. Of the pottery designs, the bulging rim is the only symbol to have a significantly different mean from during/after the Little Ice Age than before. The significant changes to the pottery were potentially all indicative of problems in sample size rather than significant change over time.

The built environment was primarily fill; however, there was an *ena* [family house] located along the northern profile from levels 12-24 (in) to 60-72 (in). Radiocarbon dates from storage pits, associated with the occupation level of the housepit, are calibrated to 458 cal BP, while the date associated with the thick deposits of wood underneath the house is 544 cal BP. Suggesting that the household was occupied for 100 years throughout the beginning of the Little Ice Age. The *ena* [family house] and tunnel are similar to reports of Yup'ik structures as defined in the model of a Yup'ik house (section 5.2.1). It is also similar to reports of Thule-style structures throughout the region.

On *Ugaassat* [the Alaska Peninsula], Thule structures are multi-room, rectangular or square buildings with long entry passages. The structures host a single room with connecting kitchens or living spaces in the house, or rooms along the tunnel entrance (Bundy 2007; Dumond 1984,1995, 2003). In *Nuvupigaq* [Lower Alaska Peninsula and the Aleutian Island] corporate houses emerge around 1000-500 cal BP in satellite-nucleus style. Satellite-nucleus style contains one large rectangular or square room with many connecting rooms for sleeping, cooking and storage, and an entrance tunnel (Maschner 1999, 2016; Maschner and Hoffman 2003). Along the Upper Bristol Bay during 500 BP, houses are single rooms, normally square in shape, with a large entrance tunnel (Bailey 1991; Larsen 1950; Ross 1958). Suggesting that there are spatial and temporal variations in houses within the Bristol Bay Region.

The identified *ena* [family house] most relates to structures built along *Ugaassat* [the Alaska Peninsula] because of the multiple cooking rooms separated within the tunnel system. The structure of the household doesn't seem variable from other households occupied in the region along the *Ugaassat* [the Alaska Peninsula] during and before the Little Ice Age. Suggesting that the Little Ice Age didn't alter the *ena* [family house] identified at *Temyiq Tuyuryaq.*

Chapter 9
Research Implications

The purpose of this research is to ascertain village level information regarding the function of tools and the built environment at *Temyiq Tuyuryaq*. The project also explores macroscale implications, situating *Temyiq Tuyuryaq* in space and time. To interpret the results, this project follows aspects of an Indigenous archaeological framework and standard archaeological analysis. Lines of evidence include Yup'ik oral traditions, language, subsistence, rituals and art, in addition to ethnographic, historical and archaeological evidence. This chapter answers the questions posed by the research objectives including 1) are Kowta's (1963) dissertation conclusions supported by this thesis research, 2) do Indigenous archaeological frameworks and standard archaeological analysis complement each other to support a nuanced interpretation of *Temyiq Tuyuryaq* history, 3) what are the systems of activities in the built environment and 4) how did the Little Ice Age change *Temyiq Tuyuryaq* material culture.

9.1 The *Temyiq Tuyuryaq* Village

Although having implications for the whole village, this analysis is exclusively founded on data obtained from the units excavated in 1960 (Kowta 1963). The lack of continuity in the excavation also limits analysis to only four of the fifty-five units. Thus, the information concluded here only represents a very small portion of the village, yet the project yields evidence corroborating information from other villages in the Bristol Bay region.

9.1.1 Kowta's Claims

Kowta (1963) suggests the *Temyiq Tuyuryaq* inhabitants had less access to sea mammals due to the lack of seal remains during the final 4 levels.The restricted access to sea mammals would have forced the community to move closer to land mammal hunting grounds. However, according to this project's analysis, there are almost equal numbers of tools present for land and sea mammal hunting, as well as fishing, in all occupations, although at very low artifact counts (illustrated in Figure 9.1).

According to the information derived in Figure 9.1, there are zero to three sea/land mammal hunting and fishing tools from 600 cal BP to 450-550 cal BP. From 400-500 cal BP, the total count of artifacts increases, and it drops again from modern-400 cal BP. Overall, there is no

significant change in the number of land and sea mammal hunting tools and fishing tools over the excavated occupation. Thus, this analysis does not support the suggestion that seal hunting increased in the later occupation. There was, however, a slight increase in artifacts from 400-500 cal BP, coinciding with the occupation of the housepit, potentially representing the hunting and fishing tools owned by the household.

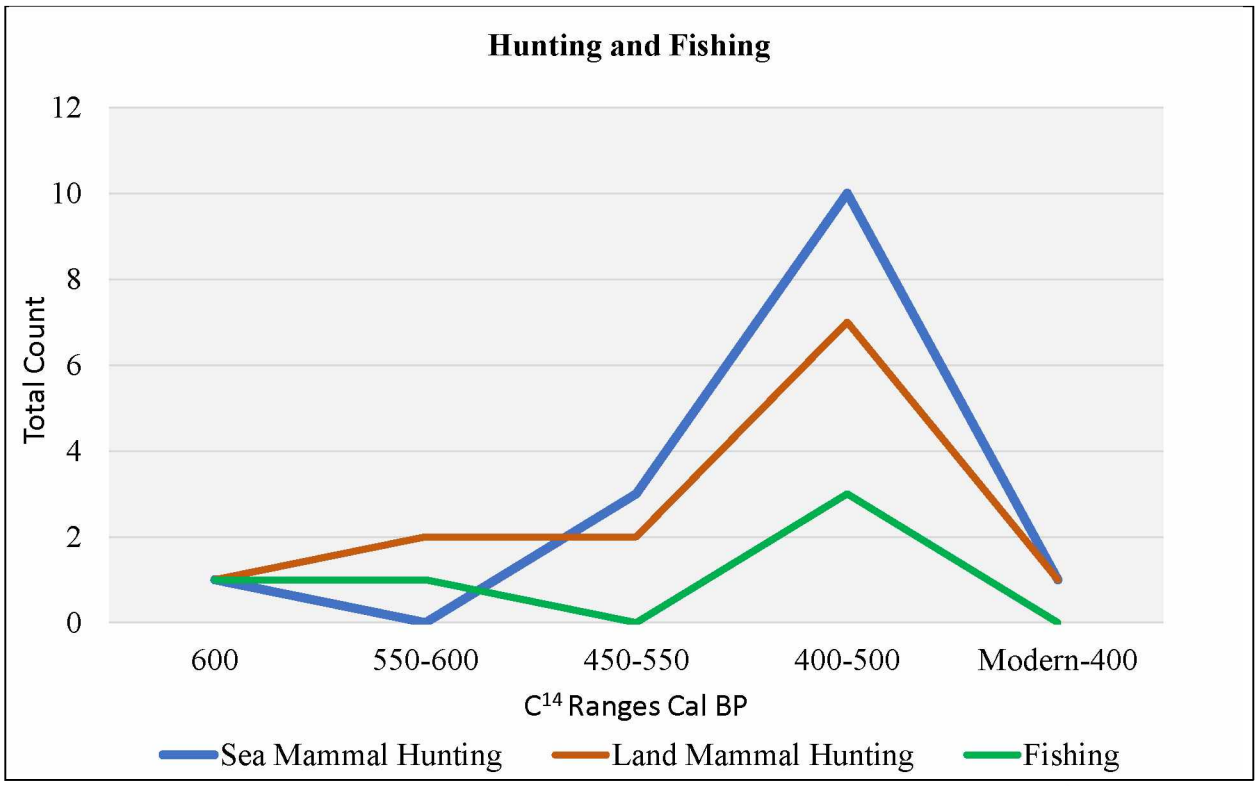

Figure 9.1 Hunting and Fishing Technology. This figure tracks the total count of sea mammal and land mammal hunting and fishing technology throughout the occupation of the excavated area. Sea mammal hunting tools significantly increase from 400-500 cal BP and drop again from modern-400 cal BP. Land mammal hunting tools also increase from 400-500 cal BP and decrease from modern-400 cal BP. Fishing tools increase by two tools from 400-500 cal BP and drop to zero tools from modern-400 cal BP.

Another conclusion drawn from Kowta's dissertation (1963) is that *Temyiq Tuyuryaq* began as a year-round occupation, but during the later occupation the village was primarily a wintering location. Kowta (1963) suggests that the village became a primarily winter encampment because there is evidence for an expanding summer salmon fishing industry, which would have occurred up the Togiak River, and what seems like an expanding winter sealing

industry. According to *Tuyuryaq* community members, occupants of the village did travel to seasonal camps for fishing, land mammal hunting, berry picking and egg collecting; however, their base village was *Temyiq Tuyuryaq* (Blue 2007; Fall *et al.* 2012; Fienup-Riordan 2007; Yanez personal comm. May 2017). There is also no evidence in the tools from the archaeological collection that fishing technology nor seal hunting tools increased (ref. Figure 9.1) before the move to *Nutraq Tuyuryaq* [New Togiak]. Thus, this project also does not support the claim that fishing became more prevalent than sea mammal hunting in the later occupation.

Kowta (1963) then concludes the overall appearance of the artifacts diminish in craftmanship during the final levels of occupation. The results of this thesis do not support diminishing craftsmanship nor diminishing tool production in any of the levels. The materials, production and designs analyzed are continuous throughout the occupation (see section 8.1).

9.1.2 The Culturally Modified Materials

Aside from testing Kowta's conclusions, this research applies a Yup'ik-based approach to analyze the production, use and discard of tools, in addition to the change and continuity of the culturally modified materials. A Yup'ik-based approach situates the artifacts within their traditional context, examining preferences for material choices, production techniques and tool use according to the descendants of the original owners and users.

To assess the materials, I created a Yup'ik-based model using oral traditions, language and art. Production of artifacts was analyzed through Yup'ik tool properties, indicating what materials were preferred in the production of certain tools over others. For example, the Yup'ik chose *teggalqupiaq* [genuine rocks] for their hardness, their ability to withstand fire and to grind soft stones (Fienup-Riordan 2007). The *teggalqupiaq* [genuine rocks] found most regularly in the collection are *ellitet* [whetstones]. *Ellitet* [whetstones] are also considered *qetruk* [hard stones] and are constructed primarily from siltstone and sandstone. Although considered a hard stone in the Yup'ik system, the western system considers siltstone and sandstone soft stones (1-3 rate) on the Mohs hardness scale. Conversely, the Yup'ik consider *ulukaq* [black slate] a soft stone, whereas the western system considers slate harder than siltstone and sandstone (5.5 Mohs rate). *Ulukaq* [black slate] is the material always chosen, minus one tool, for cutting and blade tool material (uluaq [ulu], knife, hunting weapons) because it is easily sharpened by the harder *ellitet* [whetstones]. Using the Yup'ik systems of properties aids in understanding the choices

precolonial Yup'ik people made when producing the culturally modified *teggalquq* [stones] in the collection.

Exploring oral traditions also gives insight into the location of raw material collection (Fienup-Riordan 2007, Fienup-Riordan *et al.* 2015). Residents gathered *ulukaq* [black slate] in the *Tuyuryaq* area and used it to produce most of the ground slate technology from the excavated materials. Elders also suggest that *ulukaq* [black slate from *Tuyuryaq*] was very soft and easily manipulated, thus was prized for tool production. The name, *ulukaq* [black slate], implies a very close relation to *uluaq* [ulus], a women's cutting tool. Elders also suggest that *arviiq* [a hard, abrasive whetstone from *arviiq* [Platinum] was good for grinding *uluaq* [ulus] and it was found multiple times throughout the excavation.

Culturally modified fauna was also analyzed using information supplied from oral traditions. *Tuyuryaq* residents hunted *tuntu* [caribou (*Rangifer tarandus*)], or collected antlers, along migration routes. The Togiak River and adjacent valleys and from *Tuyuryaq* to *Mamterat* [Goodnews Bay] were locations for hunting (Fall *et al.* 2013). The extensive use of *tuntu* [caribou (*Rangifer tarandus*)] throughout the excavated material suggests that these hunting locations were utilized for at least 500 years, the location passed from generation to generation. Yup'ik also hunted *asveq* [walrus (*Odobenus rosmarus*)] regularly along local islands. *Qassaqiq* [Walrus Island] hosts a large haul-out, which has been potentially utilized by local peoples for 6,000 years (Schaaf 2016).

Additionally, culturally modified *murak* [wood] was analyzed through Yup'ik properties. Elders state that Yup'ik wood workers preferred *unarciaq* [straight grained wood], longitudinally cut for constructing most materials, especially straight tools, such as shafts [Alix and Brewster 2004; Fienup-Riordan 2007]. The collection primarily falls into the *unarciaq* [straight grained] category suggesting that the inhabitants did prefer straight grained materials for 500 years.

The *tep'at* [driftwood] collection was assessed as coniferous trees from the *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] and southwestern Alaska and angiosperms from the Togiak River. Both angiosperms and conifers were used to construct a variety of tools, suggesting that there was no preference for hardwood or softwood in tool production. However, conifers were collected significantly less after 500 cal BP, implying that the people would have travelled much further along the beach on the *Nutaraq Tuyuryaq* [New Togiak] side to collect

tep'at [driftwood]. The conclusion corroborates community evidence that the people moved from *Temyiq Tuyuryaq* to be closer to a *tep'at* [driftwood] source.

Connecting the production, use and discard of the culturally modified materials to Yup'ik knowledge introduces a nuanced understanding of the lifecycle of the objects, expanding and complementing standard archaeological analysis. The Yup'ik-based approach also pulls us closer to the preference and behavior of the original constructors and users. It aids in widening our breadth of knowledge on precolonial Yup'ik technology and gives us a glimpse into the extensive knowledge the occupants had, and still have, about the environment, the animals and the people.

9.1.3 The Built Environment

The lack of information regarding the cultural materials and excavated area makes it difficult to analyze the built environment; however, using the activity models, I made conclusions about the village activities. Primary to the analysis are the remains of an *ena.* Traditionally the *ena*, or family house, was the locale of multiple generations of women, small children, *angakut* [shamans], and very old or sick men (Fienup-Riordan 2007; Frink 2016). It was the place where women processed, cooked and stored food and where young girls were given instruction on ways of being a proper Yup'ik person (Frink 2016). The *ena* [family house] was the domain of women; they could choose what would be cooked and stored, whom to feed, whom to invite in, and when to make decisions about life-partners, such as whether to marry or divorce. Without the essential activities conducted in the *ena* [family house], the village would be nonfunctional (Barnett 2018; Fienup-Riordan 2007; John 2003; John 2010).

Household archaeologist, Amos Rapoport (1990), describes the house as a symbol which reminds people of the proper way to behave. Activities are linked though the meaning of the setting; thus, by studying the artifacts, features, and architecture of that setting, archaeologists can understand the sociocultural activities of the people who shared the space. Assuming there is a behavioral relationship between the built environment and culture, archaeologists ask who does what, where, when, with whom, and why.

Mnemonic devices found in this analysis, reminding people how to behave, are the considerable cooking and storage activities located throughout the entrance tunnel and first occupation level in the housepit. The main components of the *ena* [family house] are the

processing, storing and cooking of foods, in addition to bone and hide care and handling. Having an exterior room in the tunnel for such activities reminded the visitors or the occupants immediately of the essential relationship women had to food production and preservation (discussed in section 5.2.1).

Additionally, *Tuyuryaq* residents remind us that the use of symbology on women's pottery was familial (Yanez personal comm. May 2017). Thus, personalized designs also would have reminded visitors or occupants of whose house they were entering and the status of the people inside. Although only scratching the surface of the *ena* [family house's] symbology, the food and storage activities in the entrance tunnel and house reminded the occupants how to act, with whom and where.

9.1.4 The Little Ice Age

Archaeologists suggest that the Little Ice Age's cooling trend affected the environment and animals in such a way as to produce intensive sea mammal and fish harvesting industries and large, corporate households (Maschner *et al.* 2009; Mason *et al.* 2019). Authors suggest the 'booming' industry led to overproduction (of what?), a rise in social stratification and corporate economies (Desjardins 2018; Maschner 2016; Maschner and Hoffman 2003; Maschner *et al.* 2009). If there was such an economic transformation at *Temyiq Tuyuryaq*, we would expect to see an expanding hunting and fishing industry, increased social stratification indicators such as *cungapak* [labrets] and increased sedentism.

The only culturally modified material which increased during the Little Ice Age, possibly a reflection of expanding hunting and harvesting industry, are slate tools, specifically *ulukaq* [blade slate material]. Additionally, there is an increase in hunting and cutting materials after 500 cal BP. This suggests that there may have been a slight increase in hunting during the Little Ice Age, however, not nearly enough to affect the village as described by archaeologists (Maschner 2017, Maschner and Hoffman 2003, and Maschner *et al.* 2009).

There are also no *cungapak* [labrets] found in the reanalysis, and the use of ornamentation does not intensify throughout the excavated area. The use of pottery also does not significantly increase during the Little Ice Age. Although only examining a small portion of the village material, this analysis indicates that the cooling trend does not alter the village's technology.

9.1.5 Alternate Interpretation

Although there are no extensive effects of the Little Ice Age on the material remains, there are trends at *Temyiq Tuyuryaq* connecting the village to other archaeological sites. Connections include an expanding slate industry and the rapid production of household complexes creating large mound structures (Frink 2016; Fienup-Riordan *et al.* 2015; Fienup-Riordan and Reardan 2016). Rather than the effects of the Little Ice Age altering and expanding materials and households, I suggest that these changes are partially occurring because of the Bow-and-Arrow War. The Bow-and-Arrow War is well understood in Yup'ik oral traditions and the effects of the war are being explored at Qavinaq in western Alaska and Nunalleq near Quinhagak (Frink 2016; Fienup-Riordan *et al.* 2015; Fienup-Riordan and Reardan 2016).

Oral traditions suggest that the Bow-and-Arrow War increased the use of weapons including slat armor and slate tools. Elders suggest there was an expanding industry in specifically *uluakaq* [black slate] because of its ability to be sharpened quickly and efficiently during the war (Fienup-Riordan and Reardan 2016: 41). In addition to the expanding slate industry, house systems were built to protect the village by compiling large mound structures and expanding the tunnel systems (Fienup-Riordan and Reardan 2016; Frink 2016). This suggests that the 3.6 meters of excavated material, accumulated in less than 200 years, was very deliberate for the protection of the village from the seaward side.

The Bow-and-Arrow War also displaced people from the *Arviryaraq/Canineq* [Yukon-Kuskokwim Flats area] and and Bristol Bay, and they moved to *Nuvupigaq* [the Alaska Peninsula and the Aleutian Islands] and Kodiak Island. Excavations along *Nuvupigaq* [the Alaska Peninsula and the Aleutian Islands] and Kodiak Island reveal Yup'ik material in both locations (Maschner 2019). The excavation in Nunalleq also unveiled a model *qayaq* [kayak] with a bow similar to those in Kodiak (Fienup-Riordan *et al.* 2015). A Yup'ik war hero, *Apanuugpak*, also lived in the *Curyuk* [Dillingham] area and traveled extensively around Bristol Bay including to *Temyiq Tuyuryaq* during the war (Fienup-Riordan and Reardan 2016).

The combination of evidence from oral traditions and the archaeology leads me to conclude that the village was occupied during the Bow-and-Arrow War. The significant changes occurring in the material culture and the built environment could correlate with changes during the war, rather than during the Little Ice Age. Although expanding sea mammal and fishing

industries may have aided villages in the production of foods and materials, I suggest that the large mound structure and the changing slate industry are reflections of warfare.

9.2 Conclusion

Framing this research to reflect Yup'ik oral traditions, language, values and ideals leads to a nuanced and holistic interpretation of the *Temyiq Tuyuryaq* village. An Indigenous archaeological approach expands this research to include Yup'ik preferences and choices in the production and use of material remains. Incorporating oral traditions as a line of evidence also connects *Temyiq Tuyuryaq* to a well-known war-time era which the Bristol Bay played a large part. A suggestion for future research includes exploring the changes and effects of the Bow-and-Arrow War across the Bristol Bay region.

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Appendix A:
Density Maps

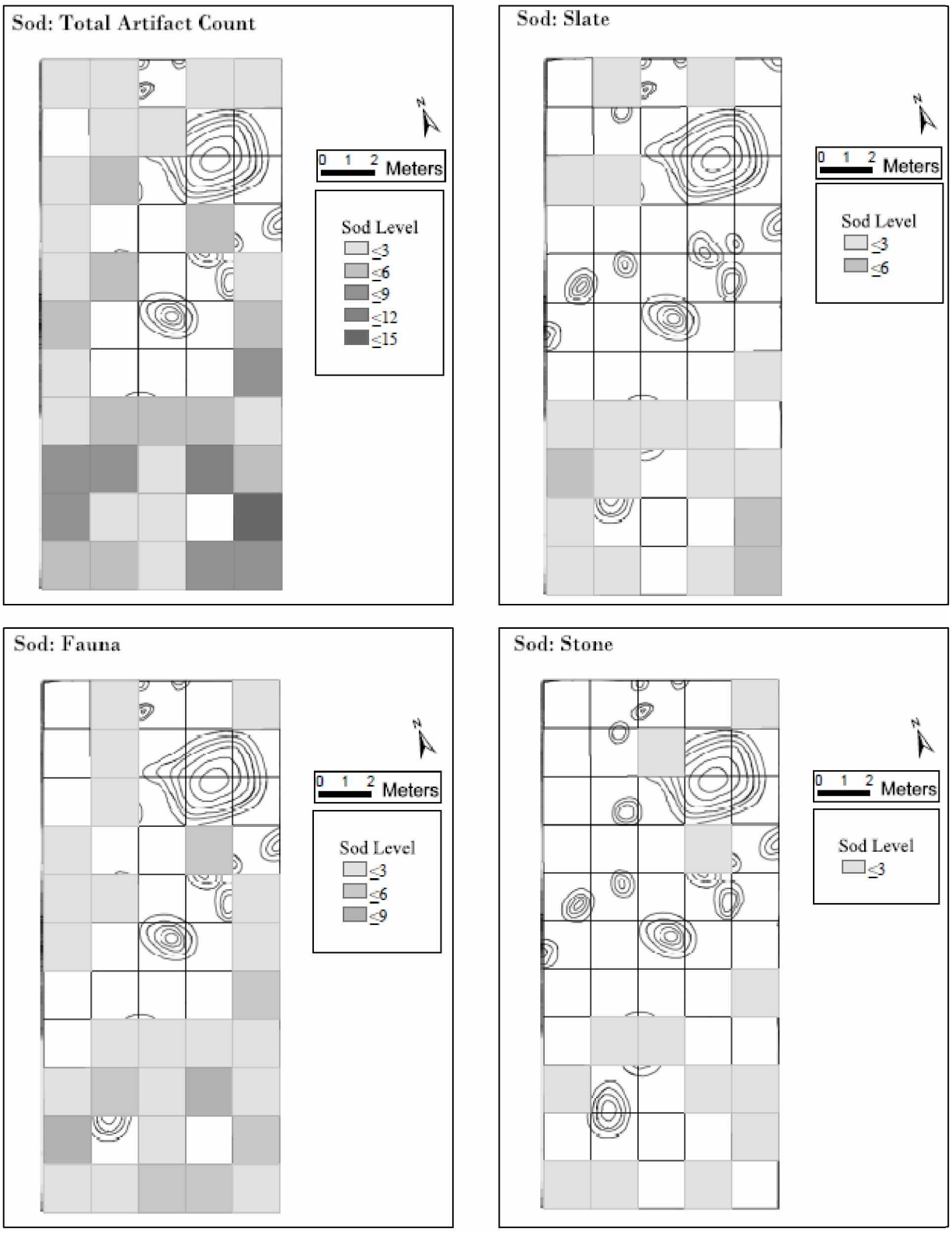
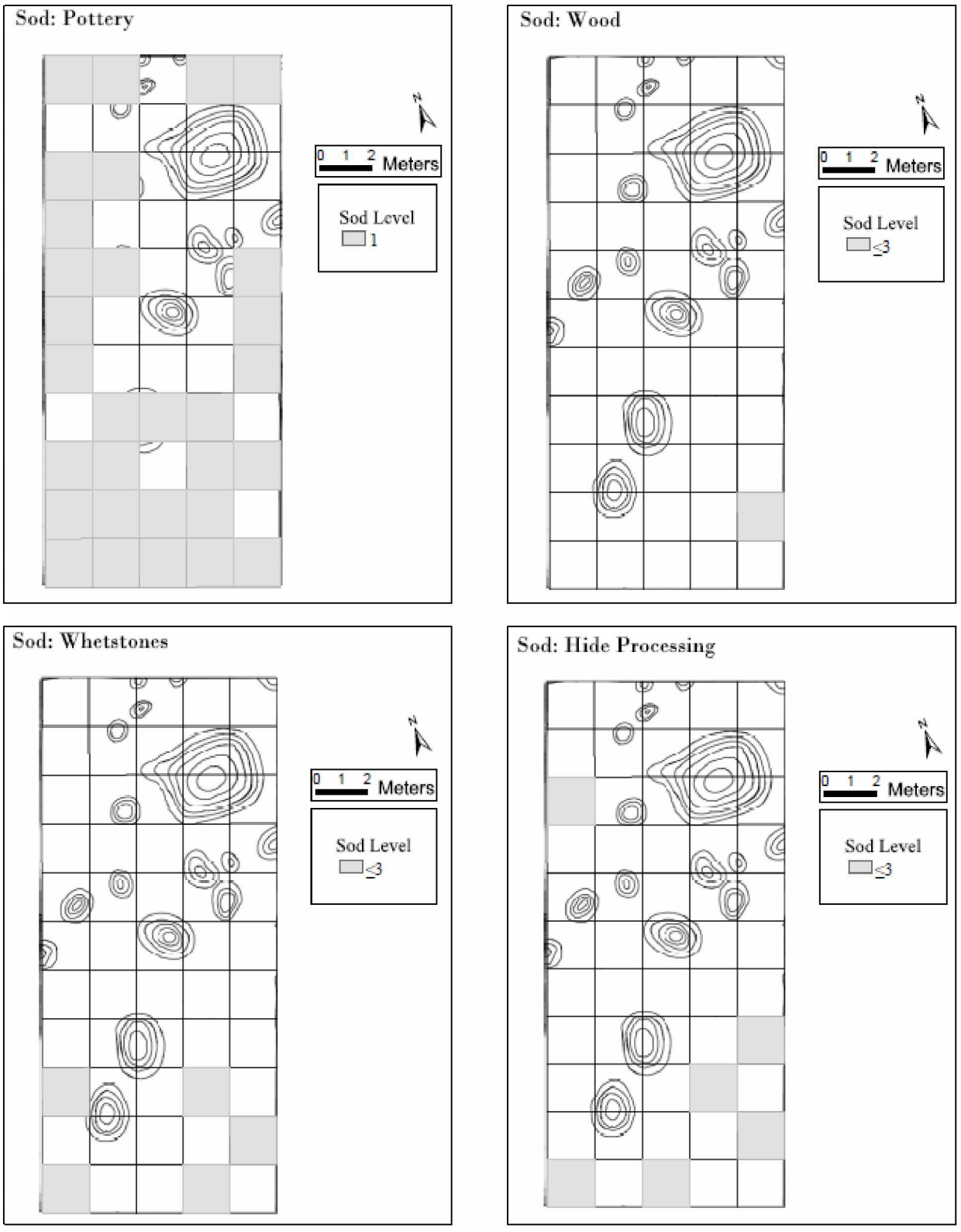


Figure A. 1.1 Sod Level Density Models and Surface Features. Continues to next page.



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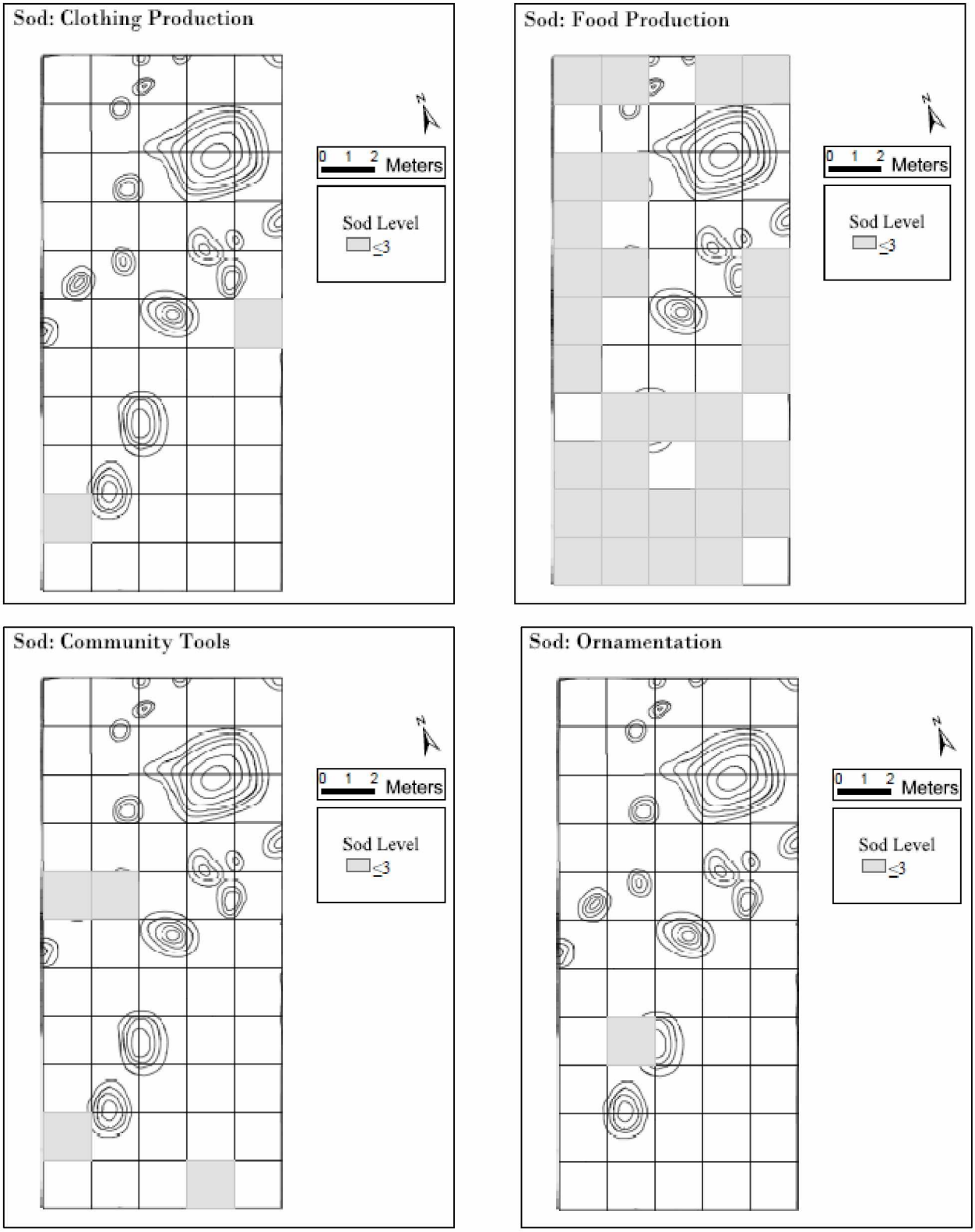

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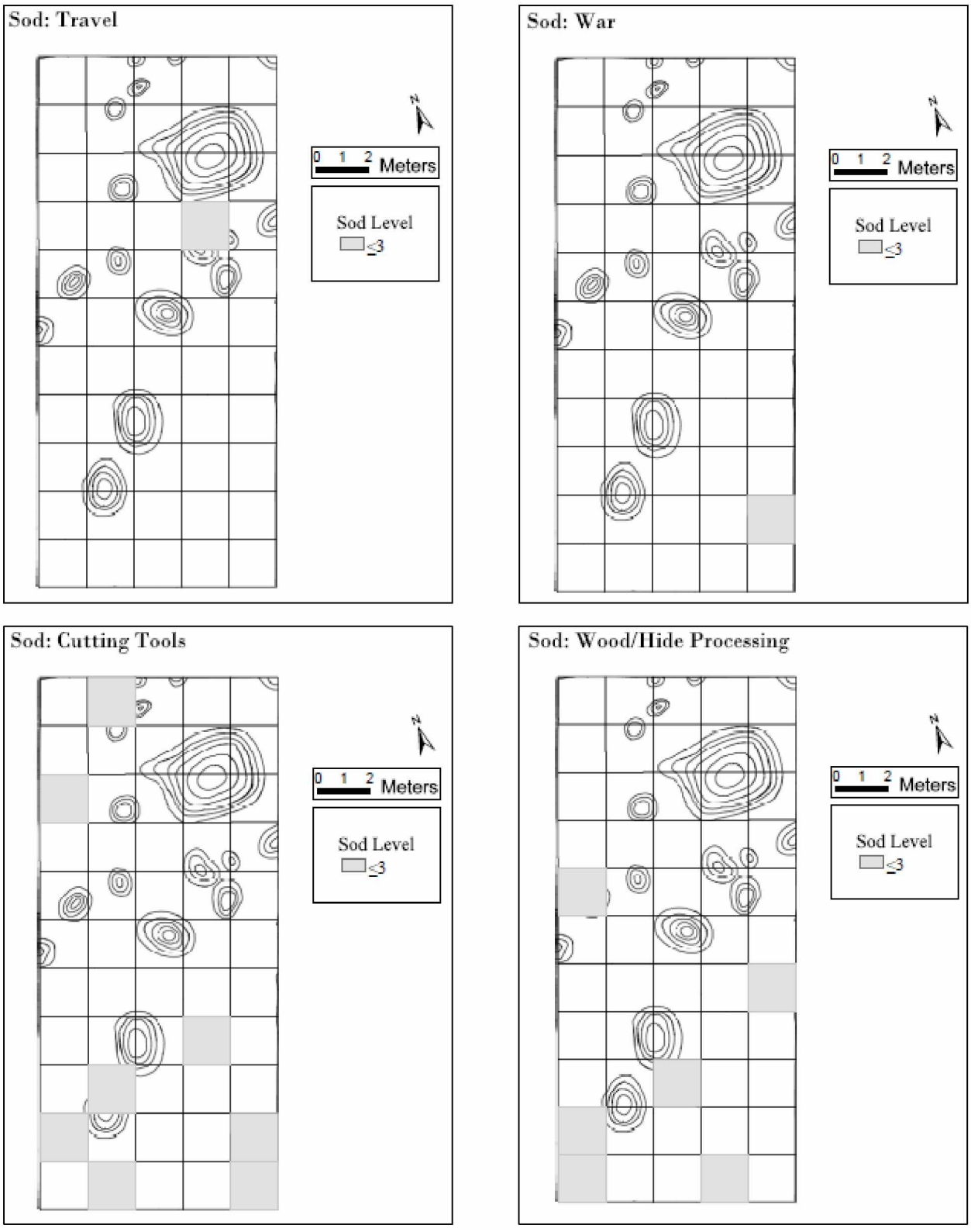

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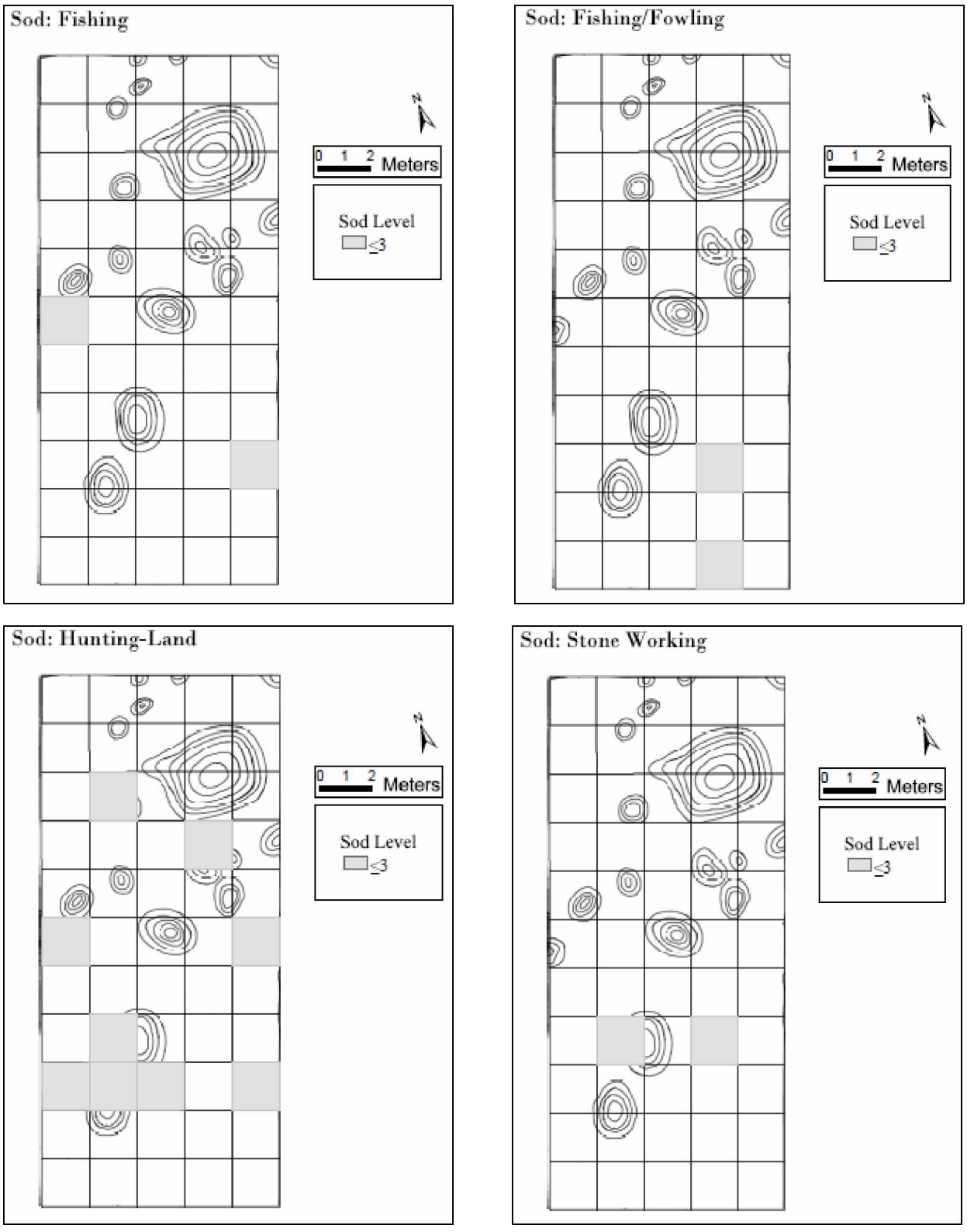

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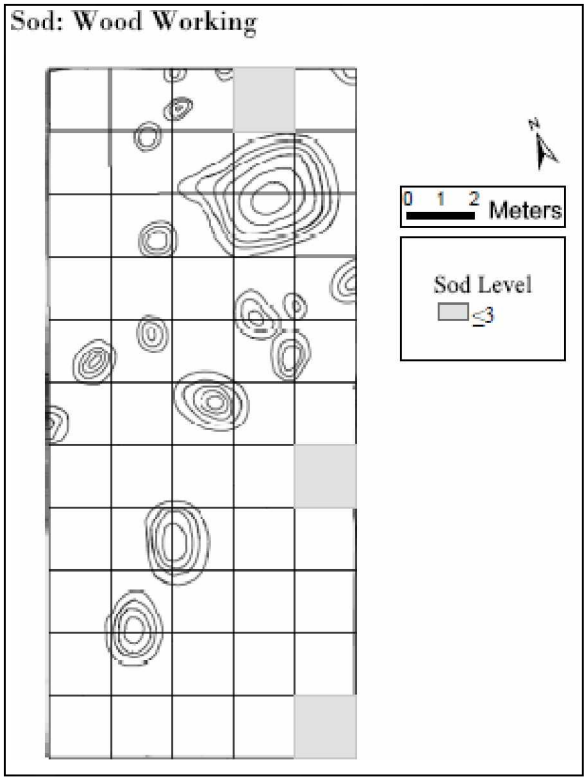

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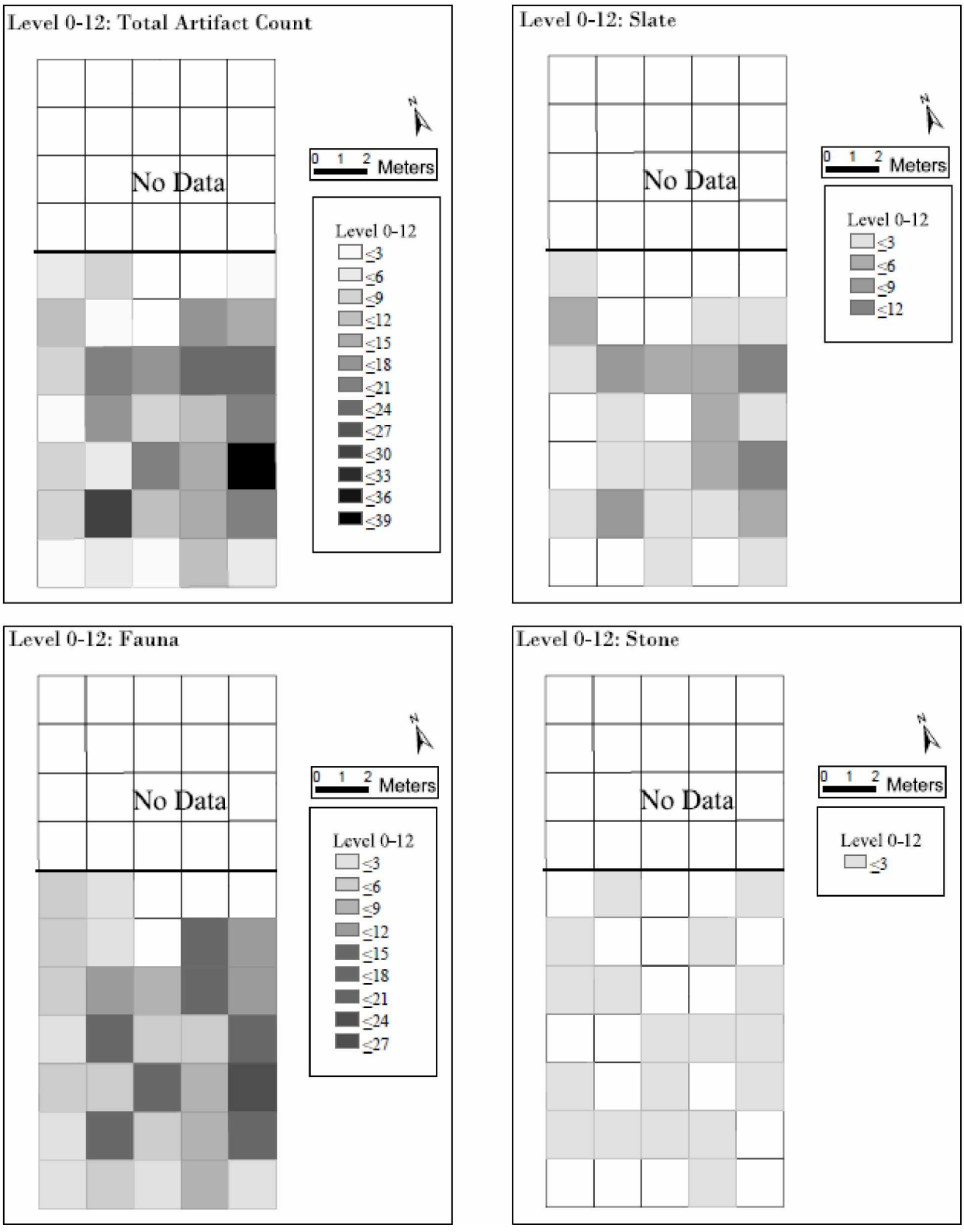

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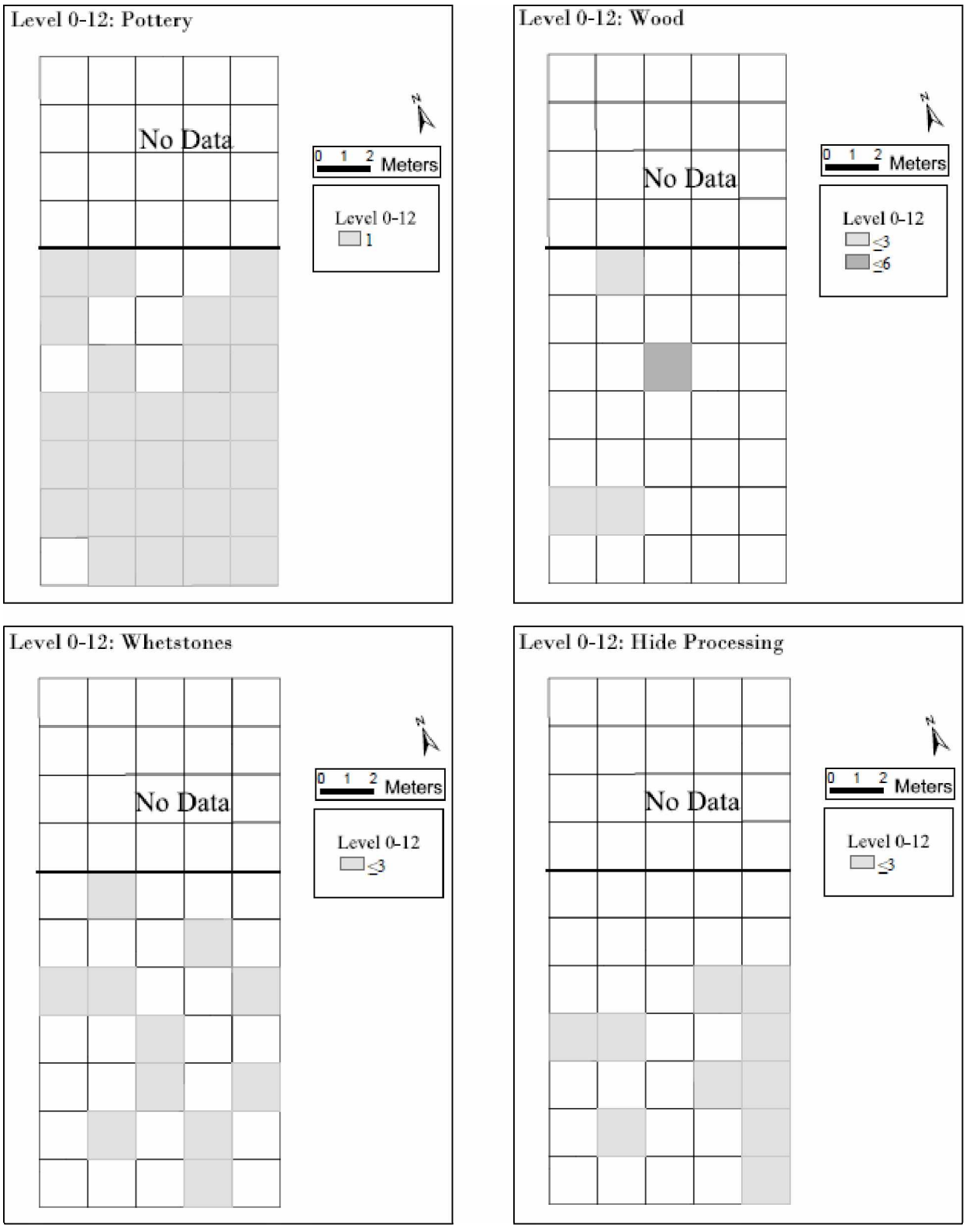

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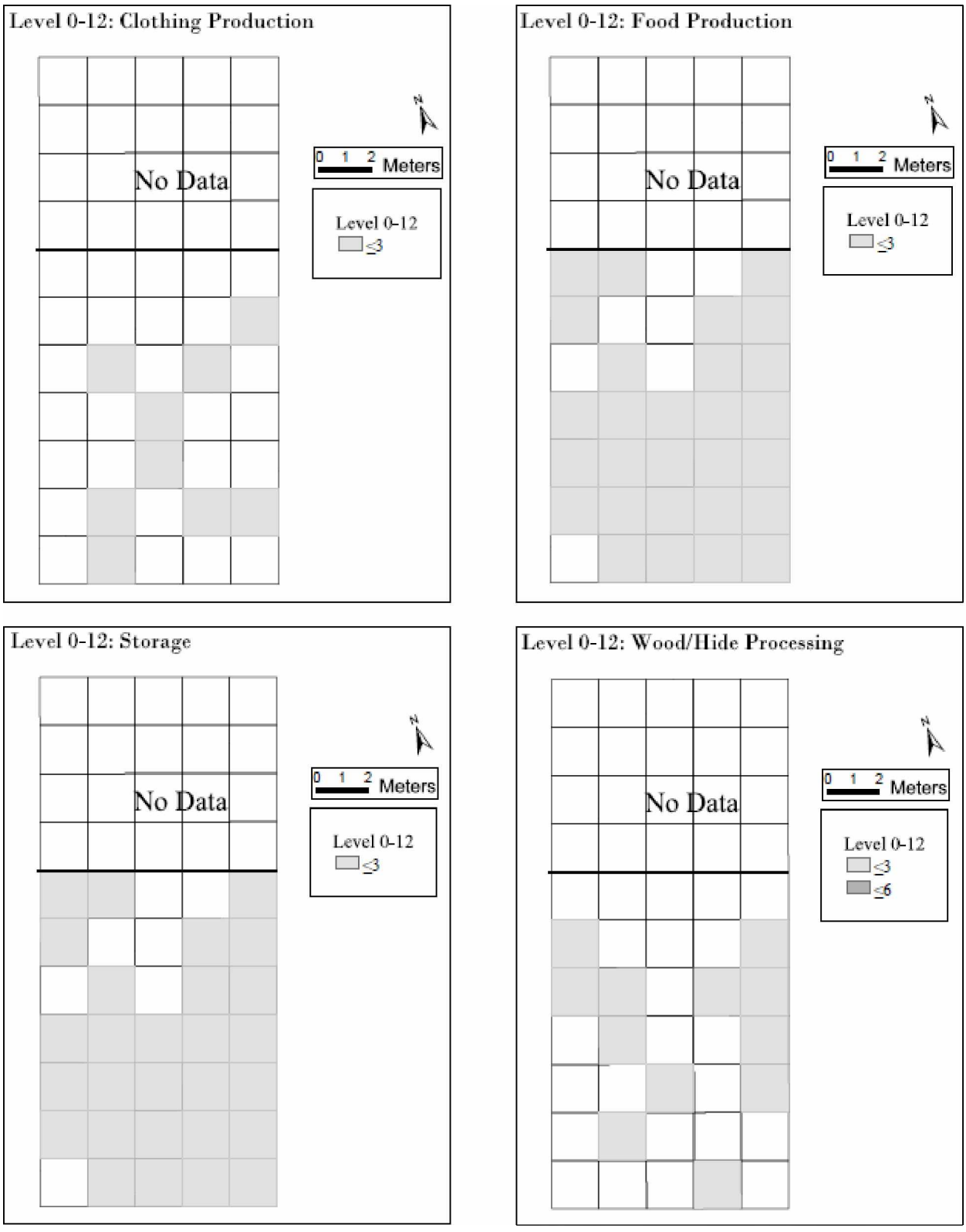

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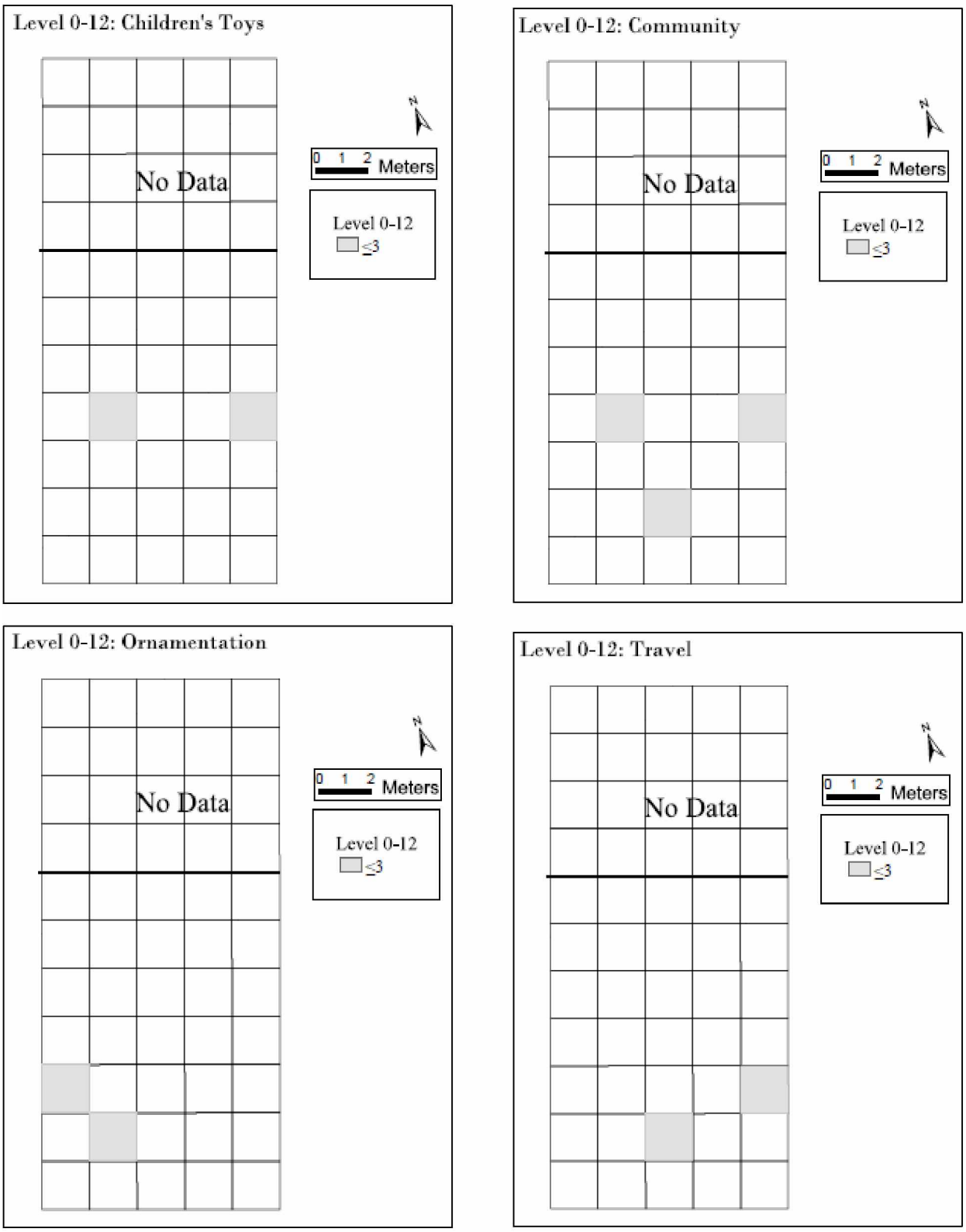

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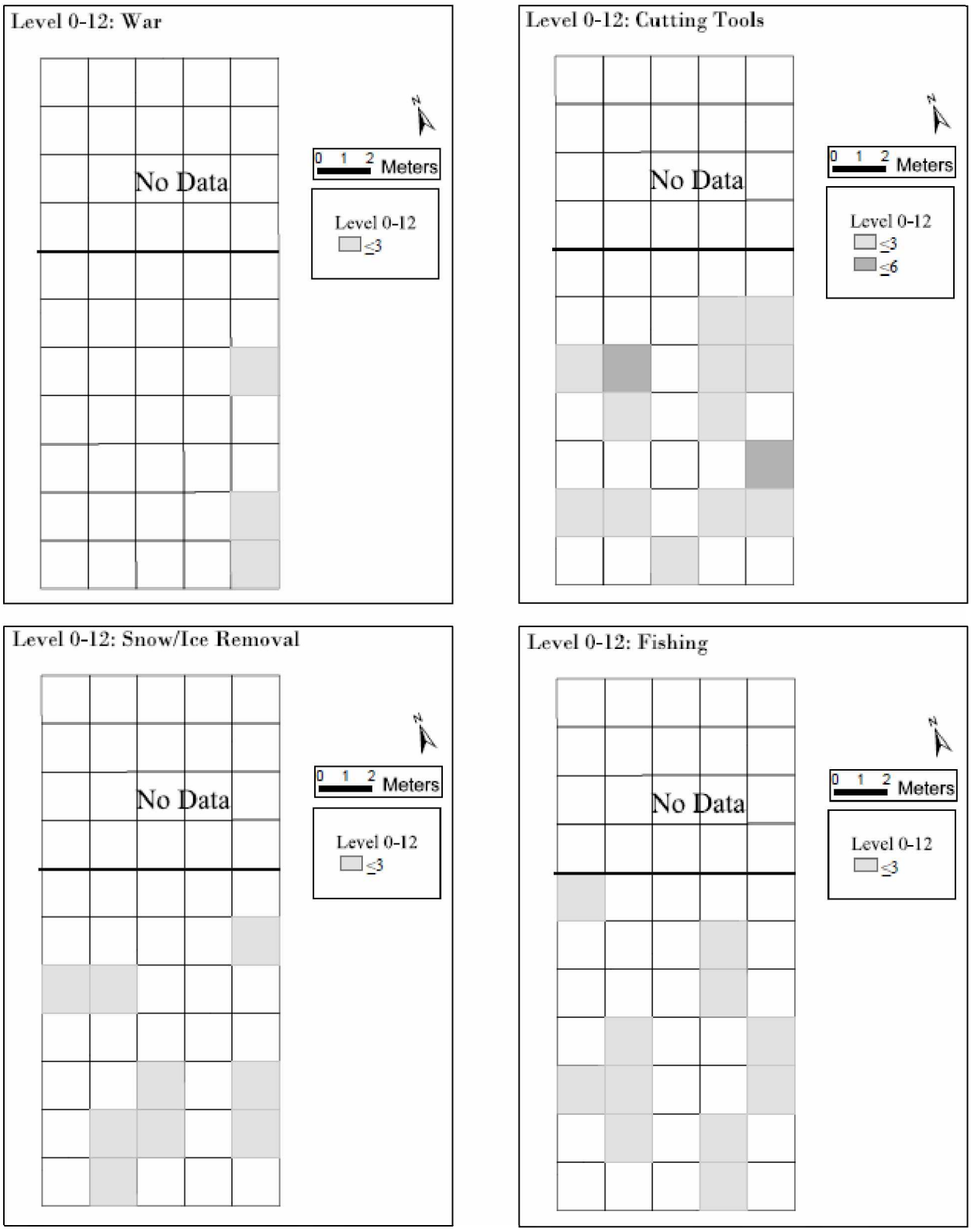

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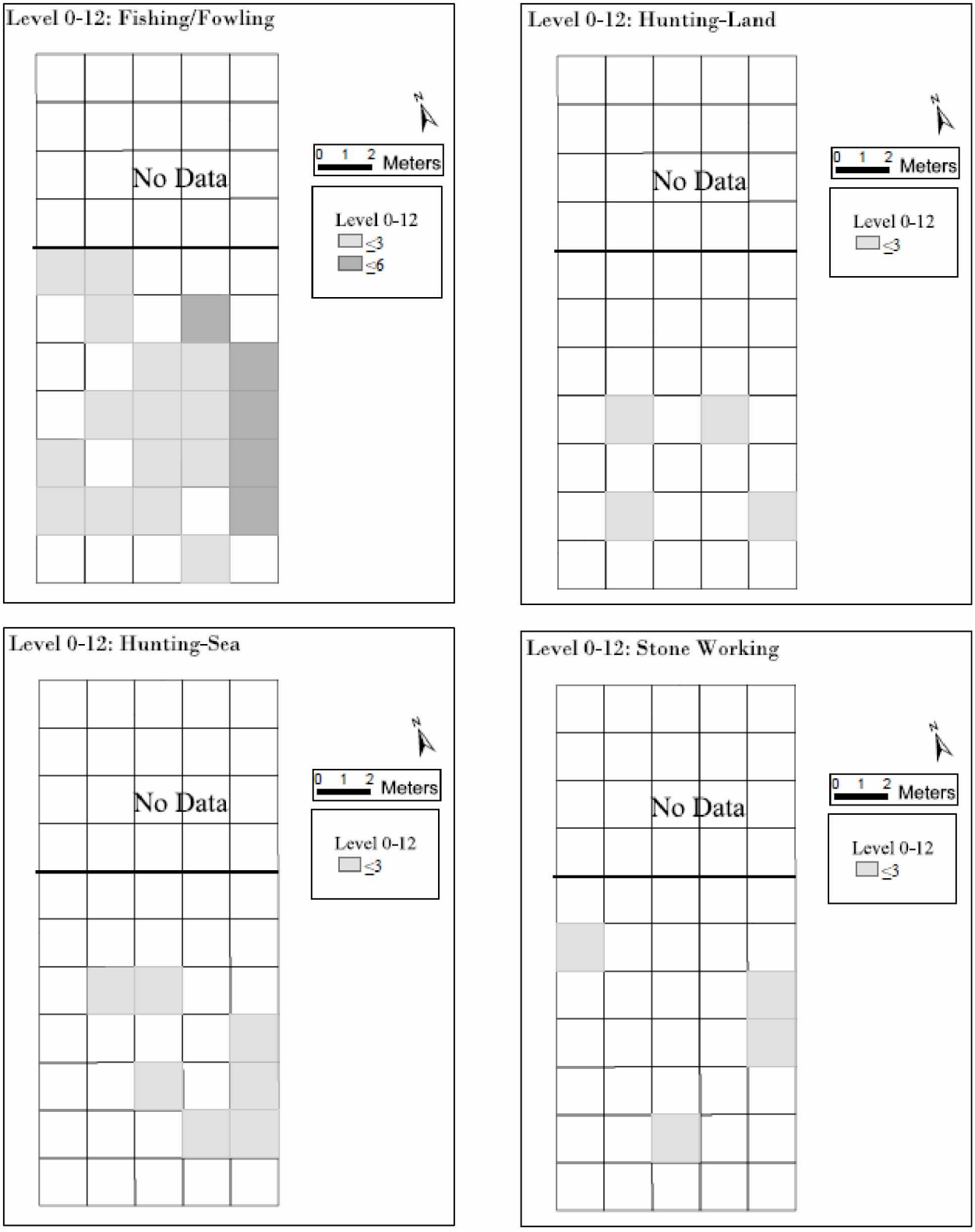

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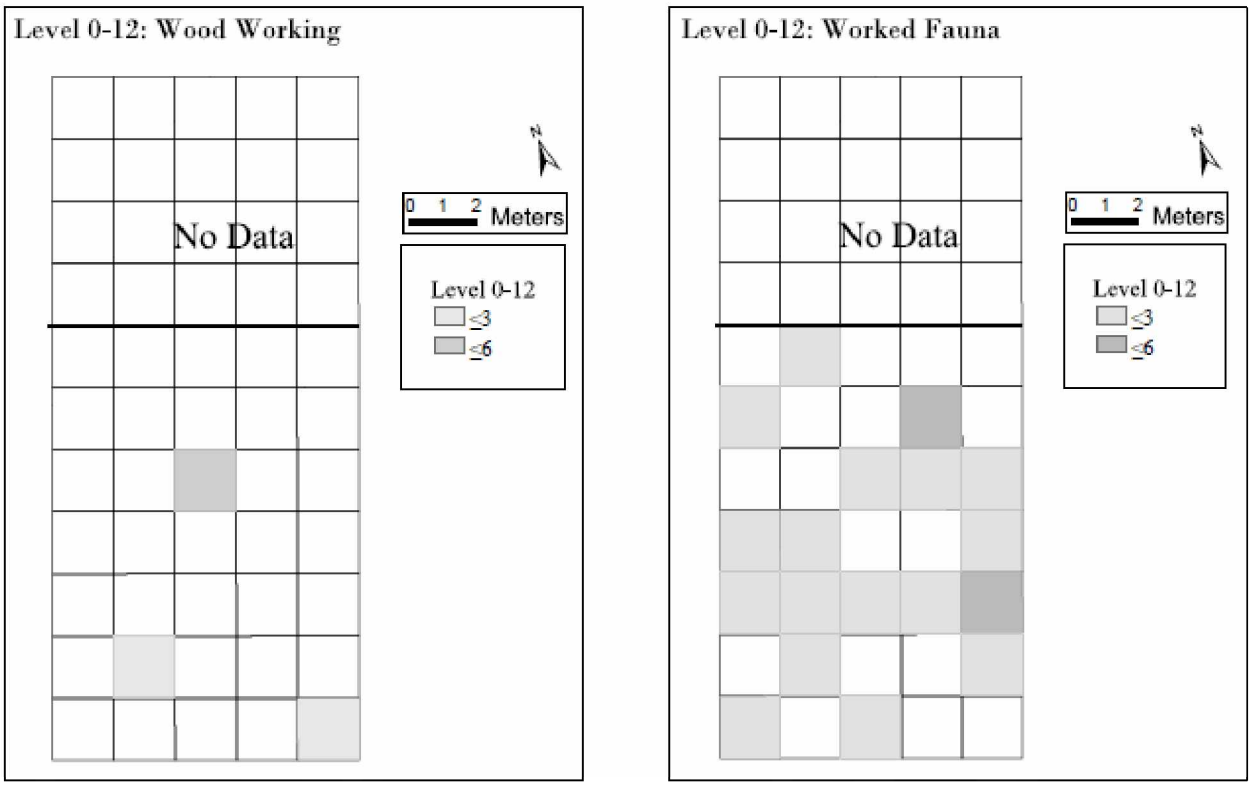

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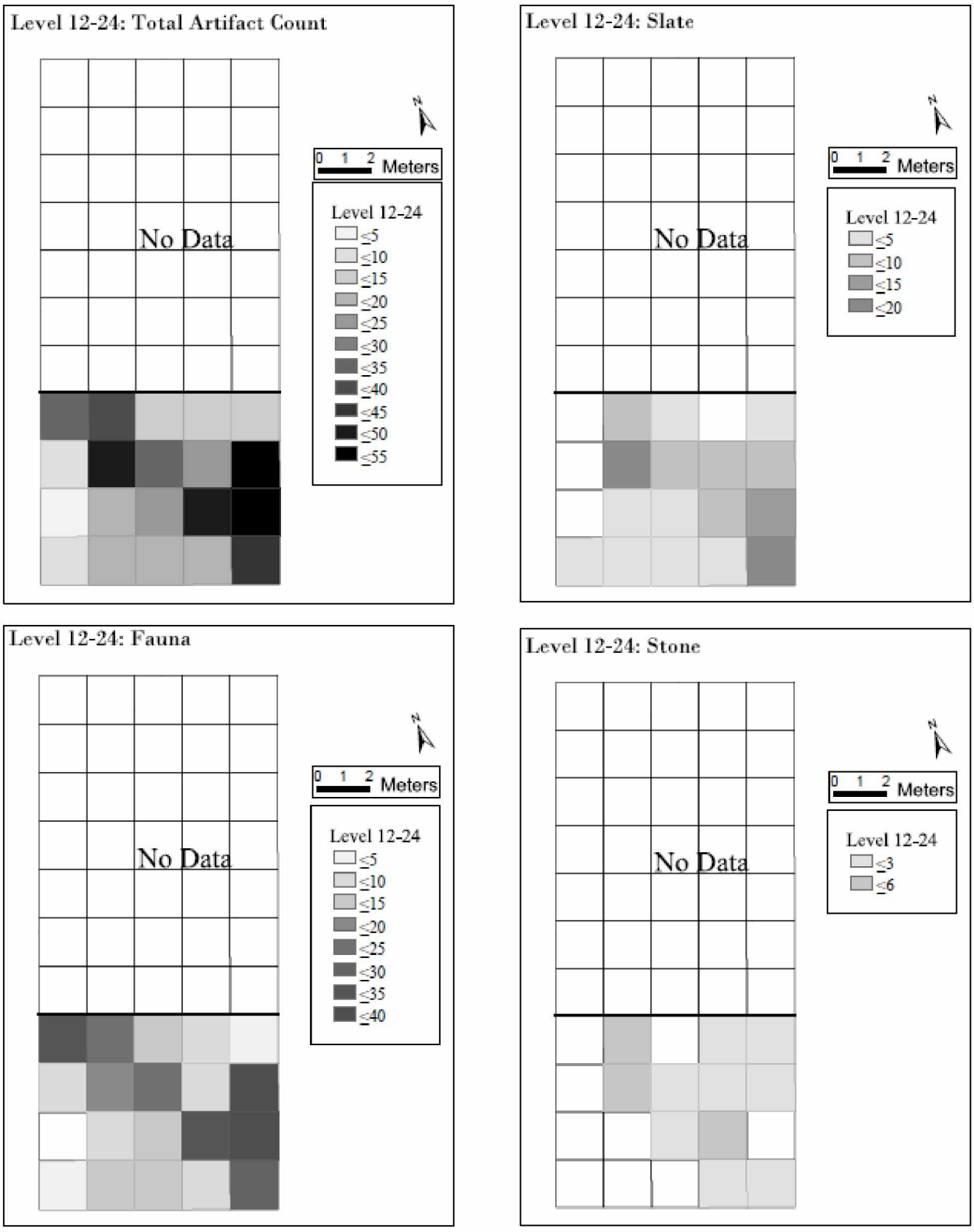

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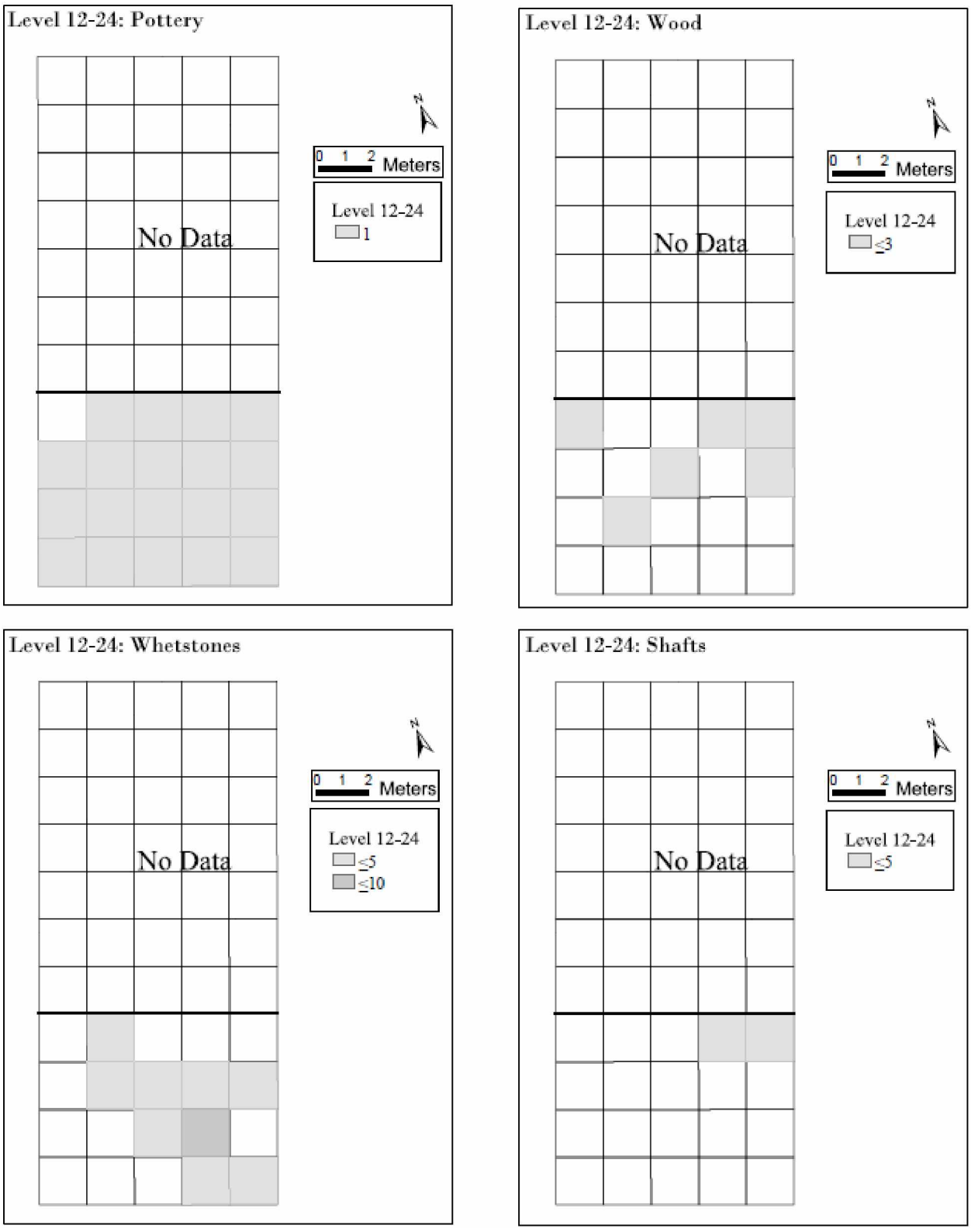

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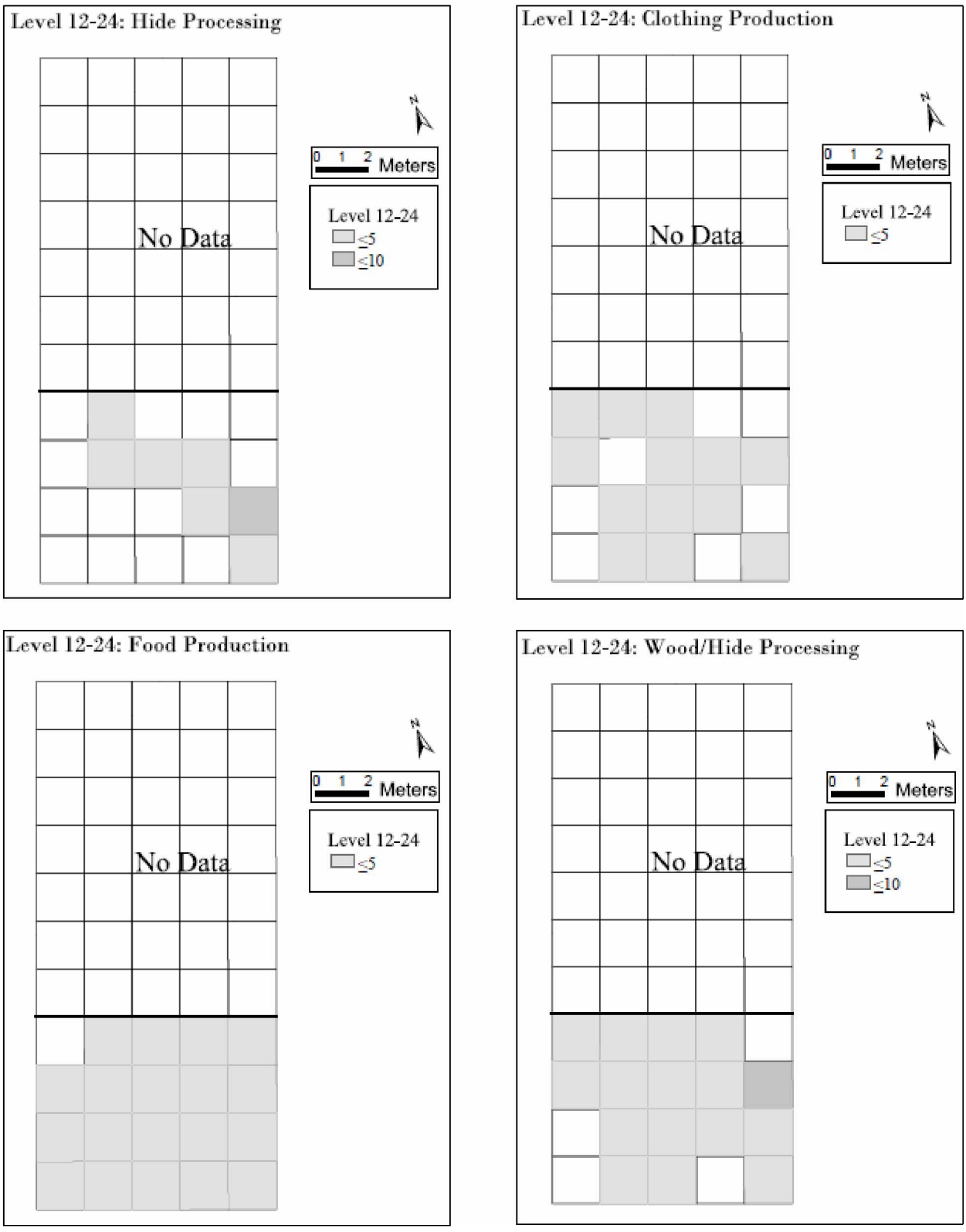

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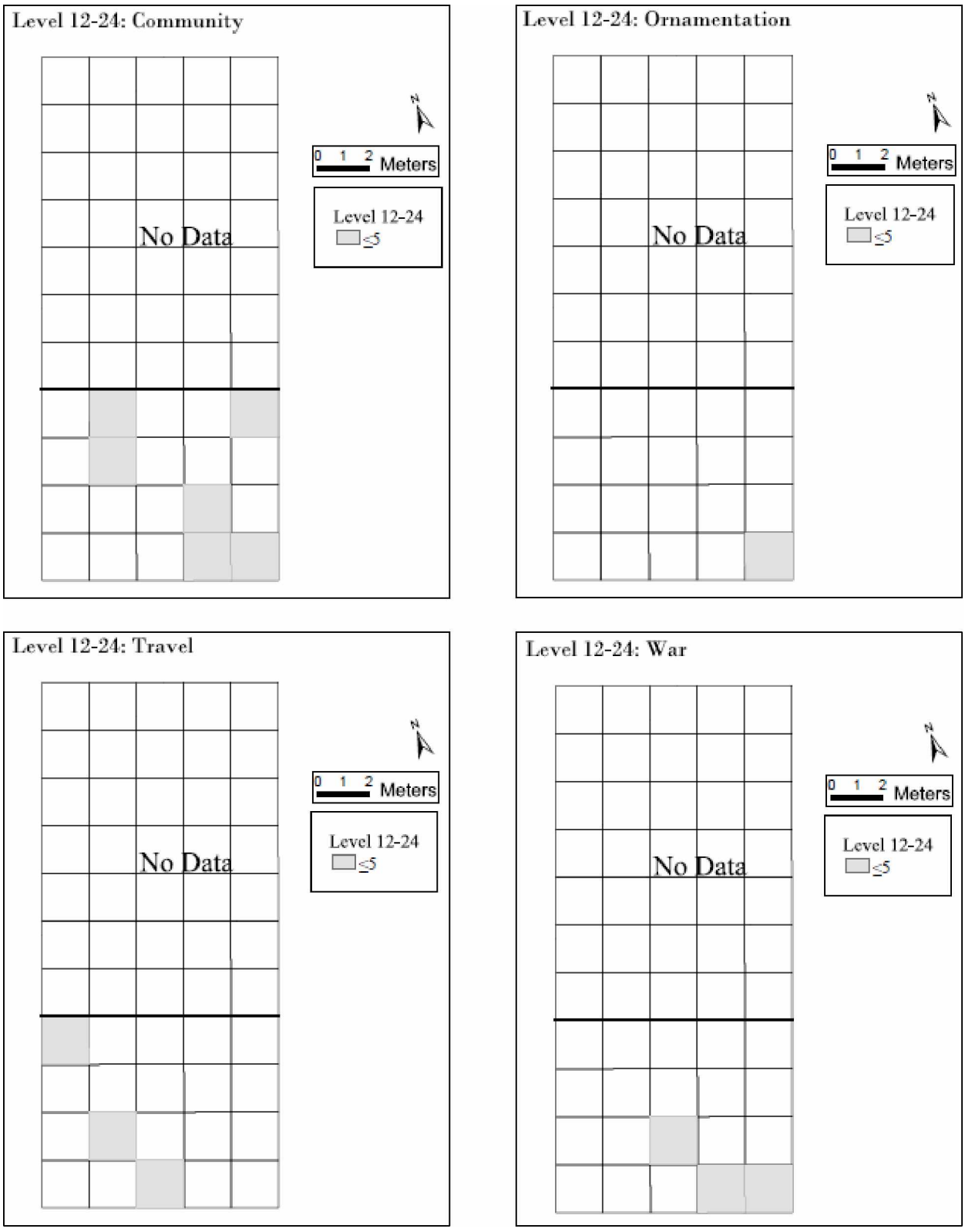

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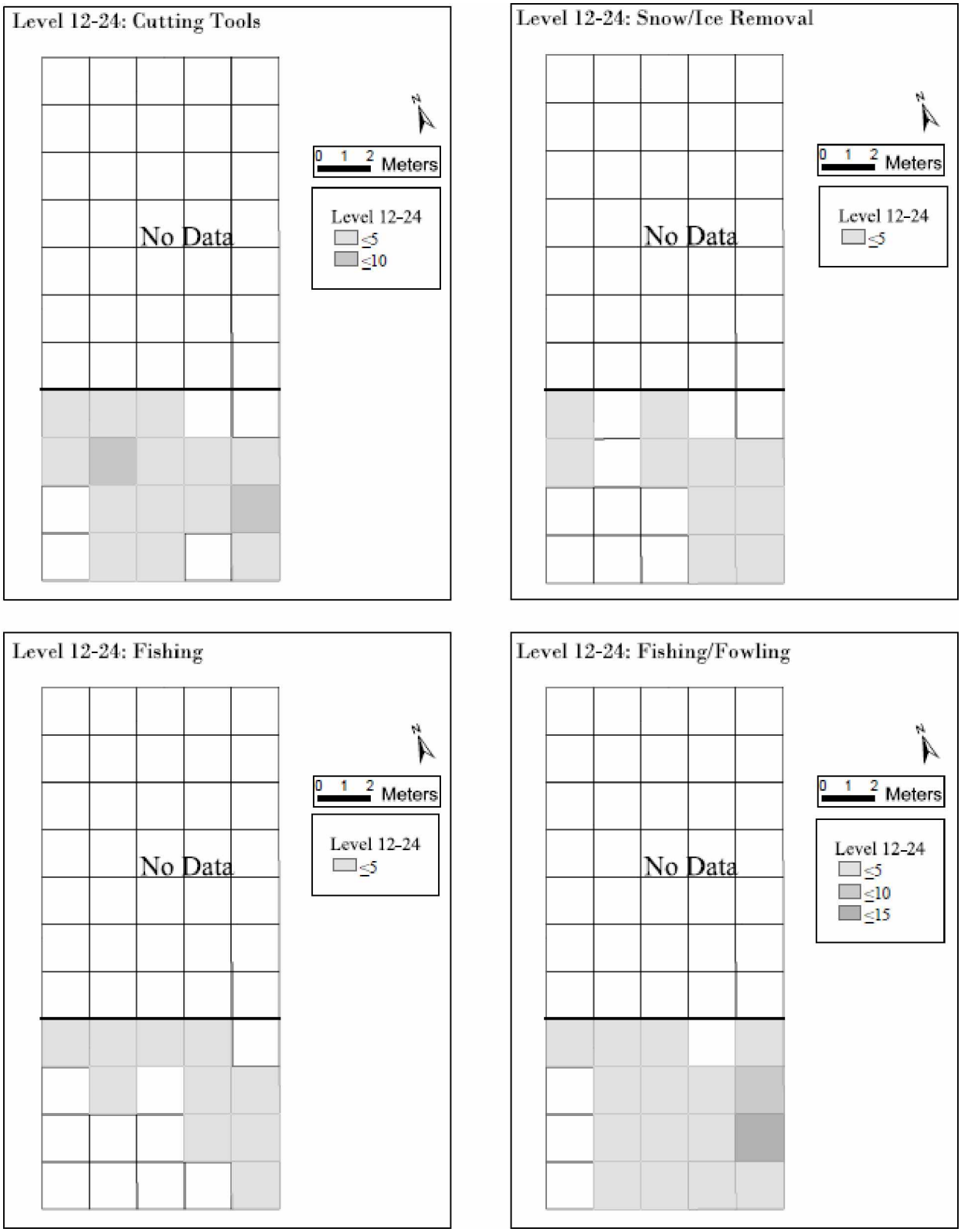

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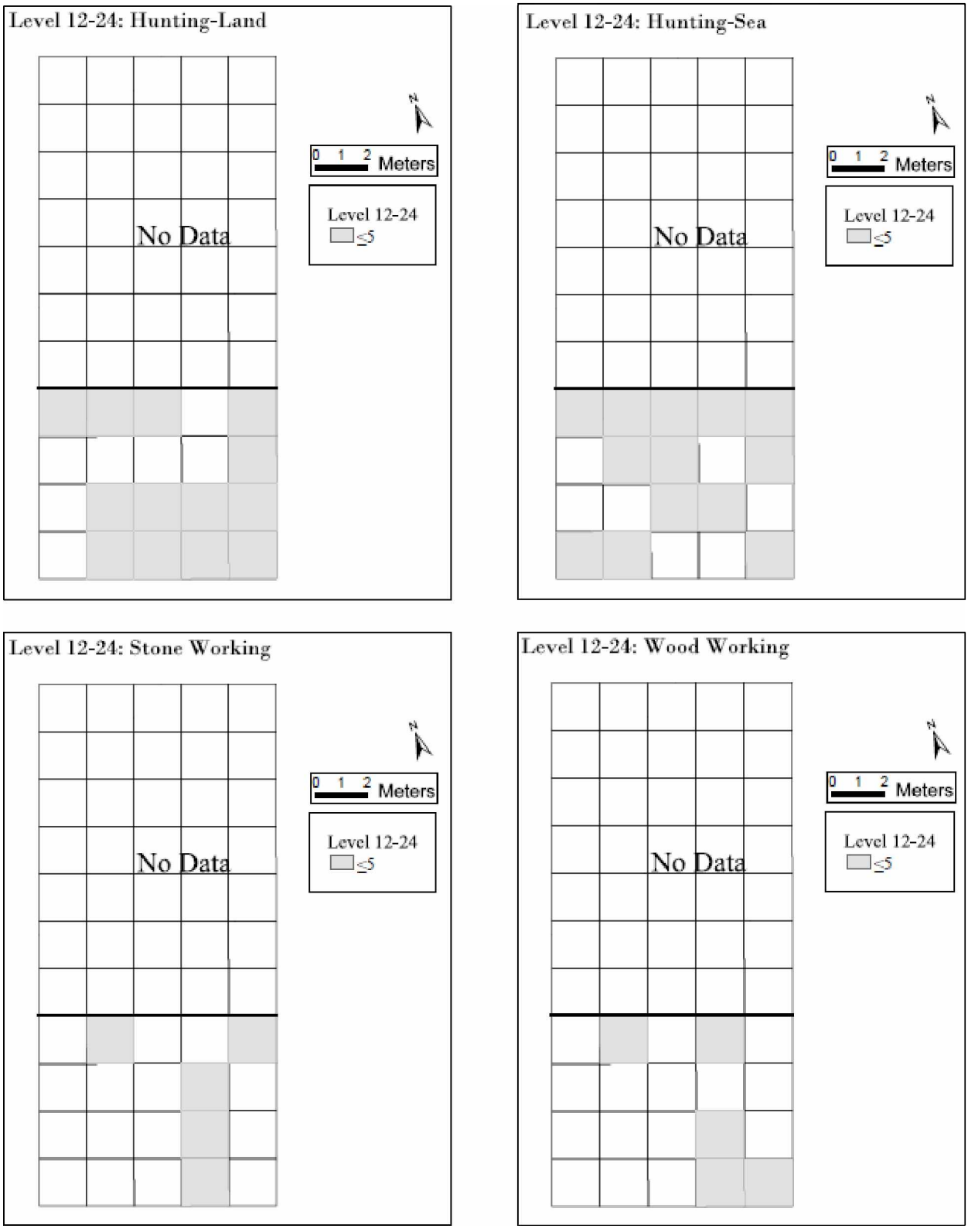

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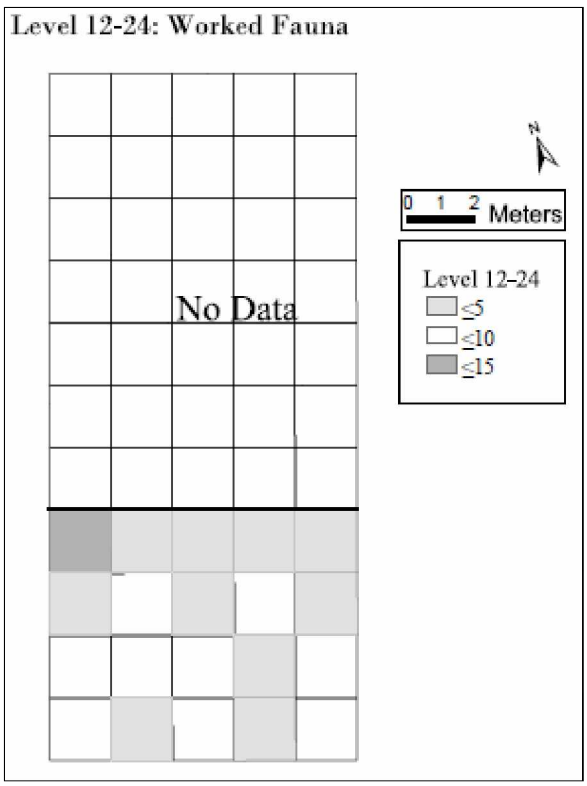

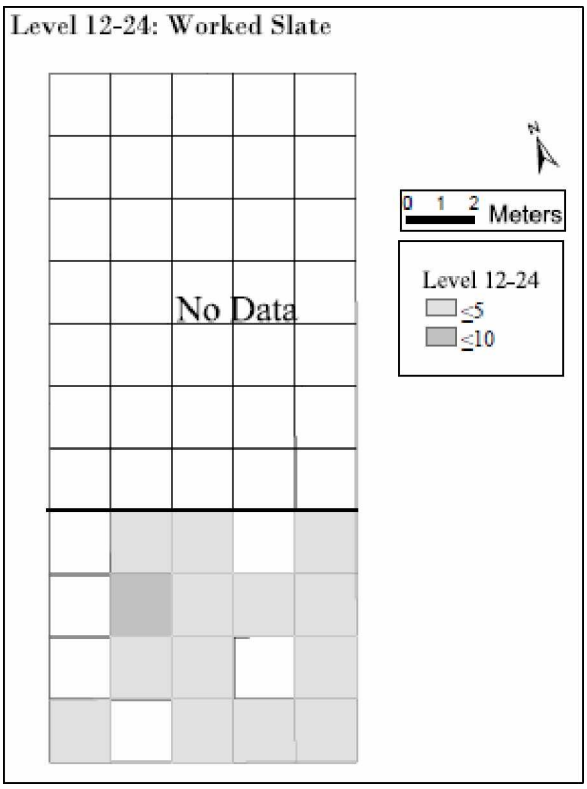

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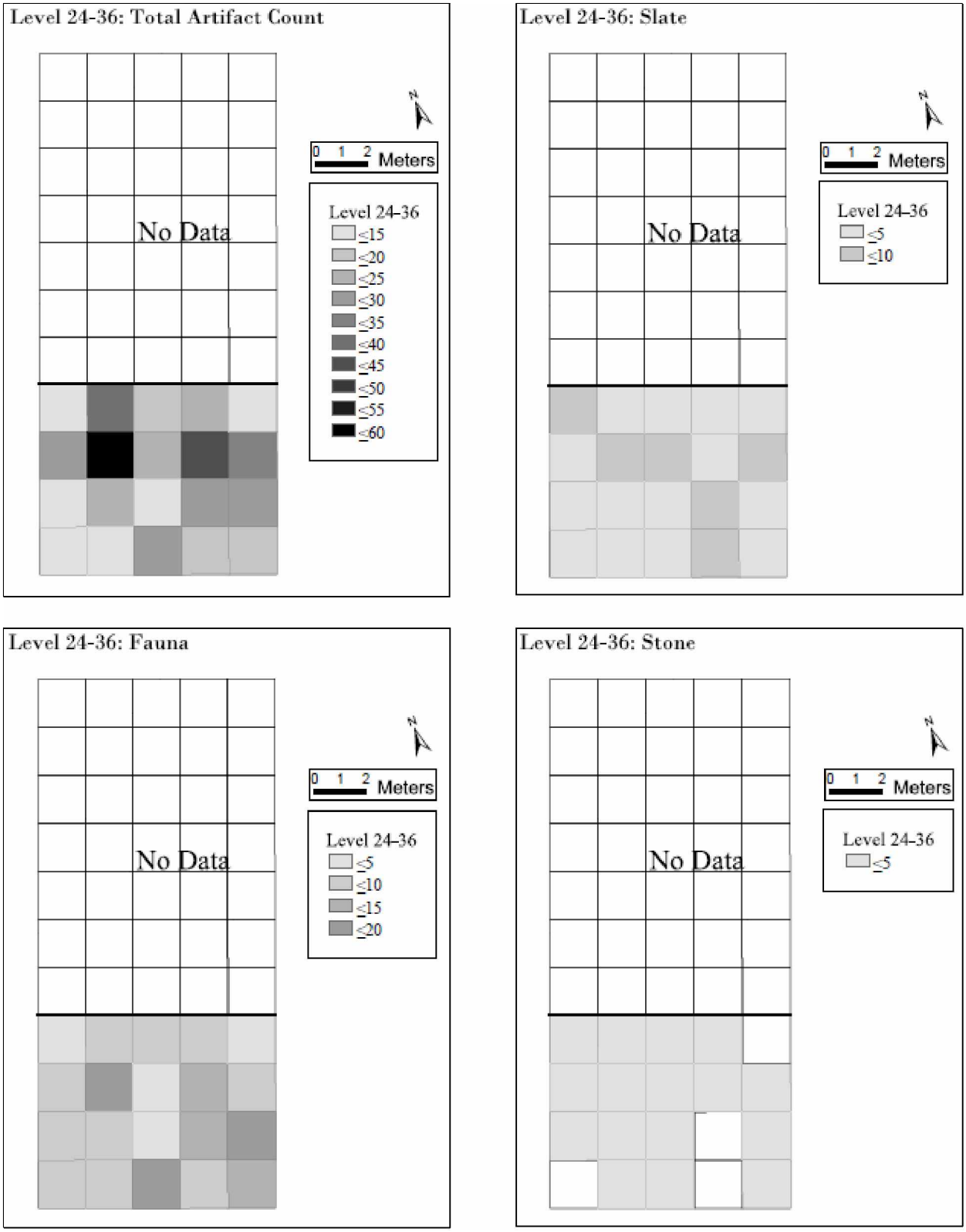

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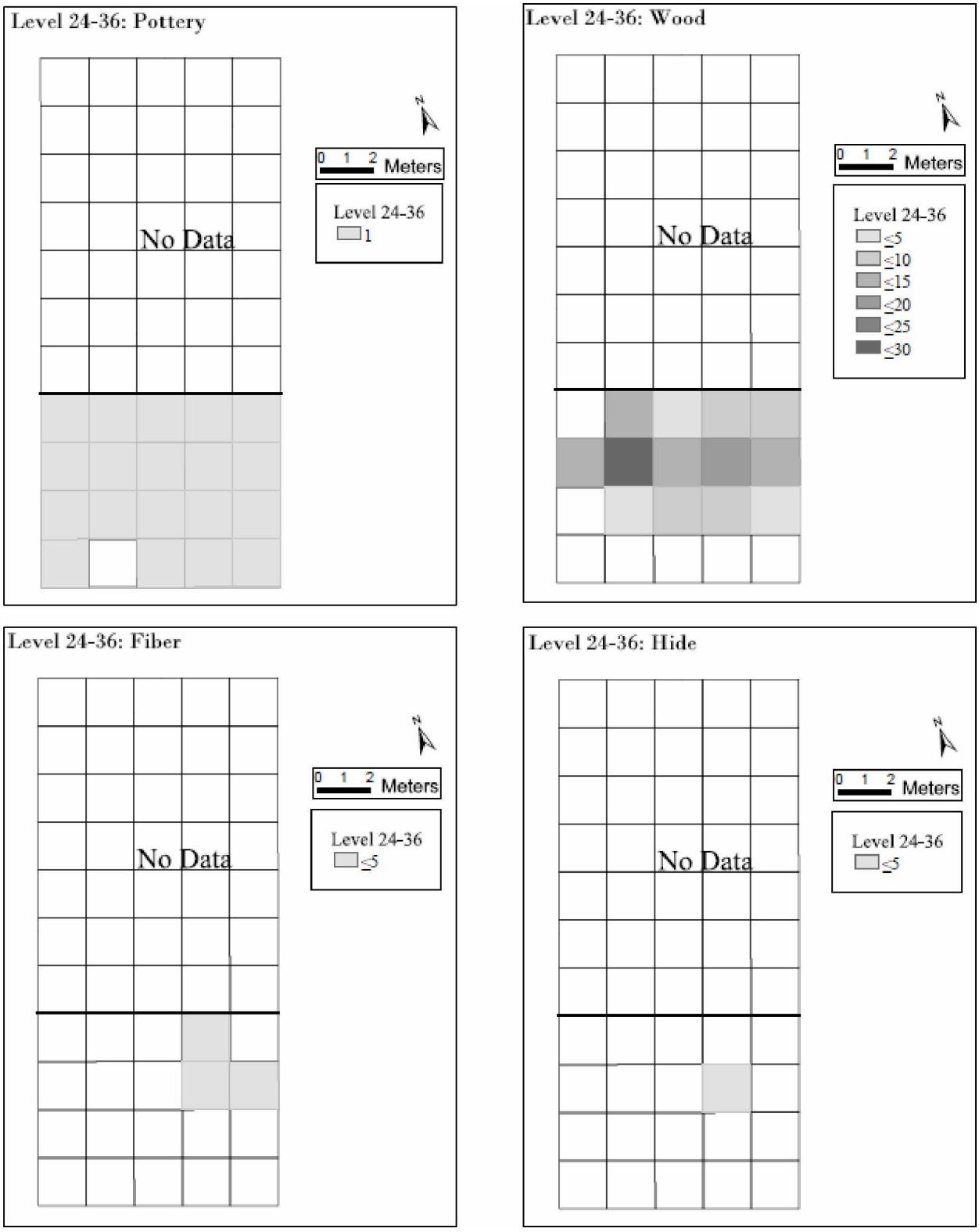

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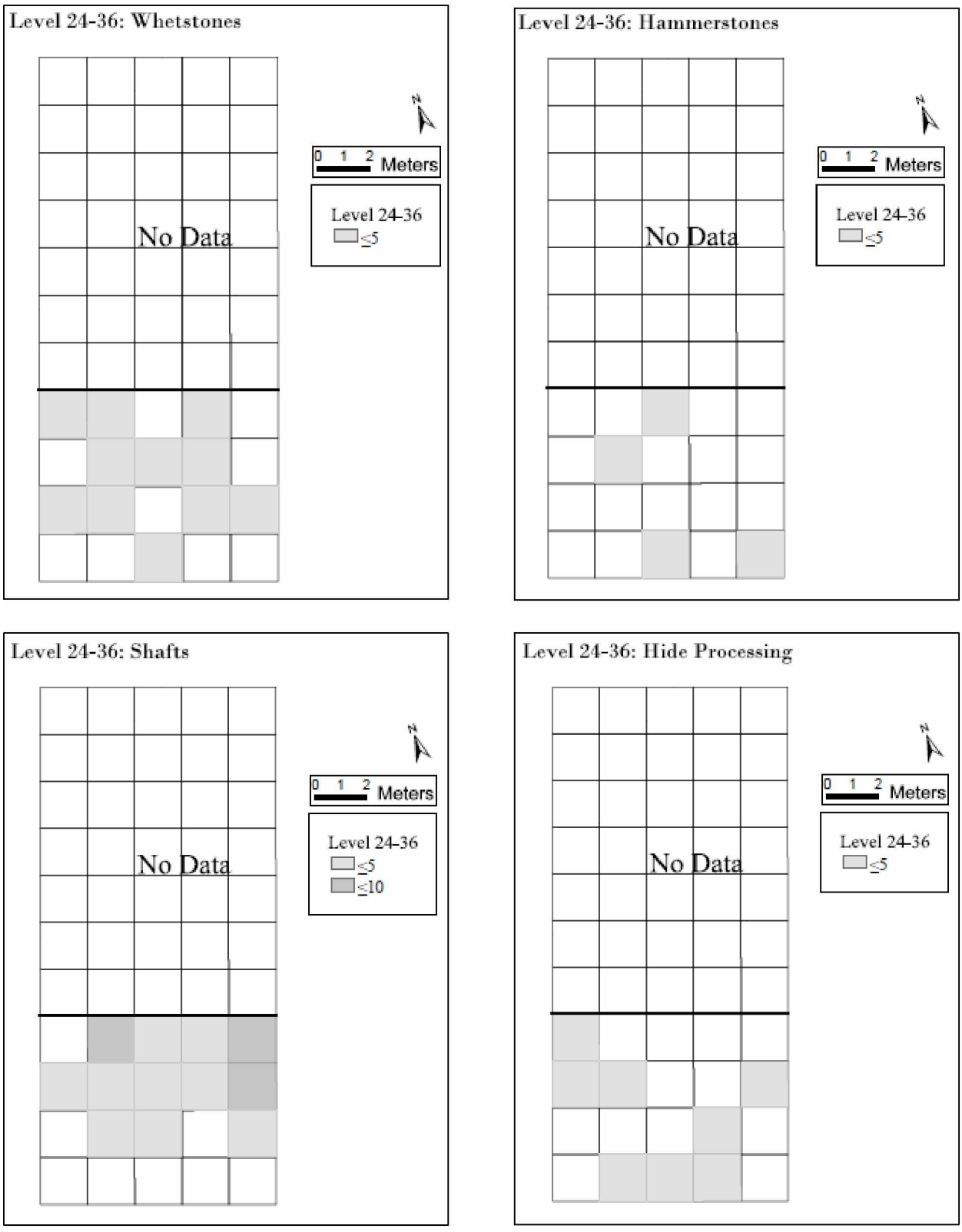

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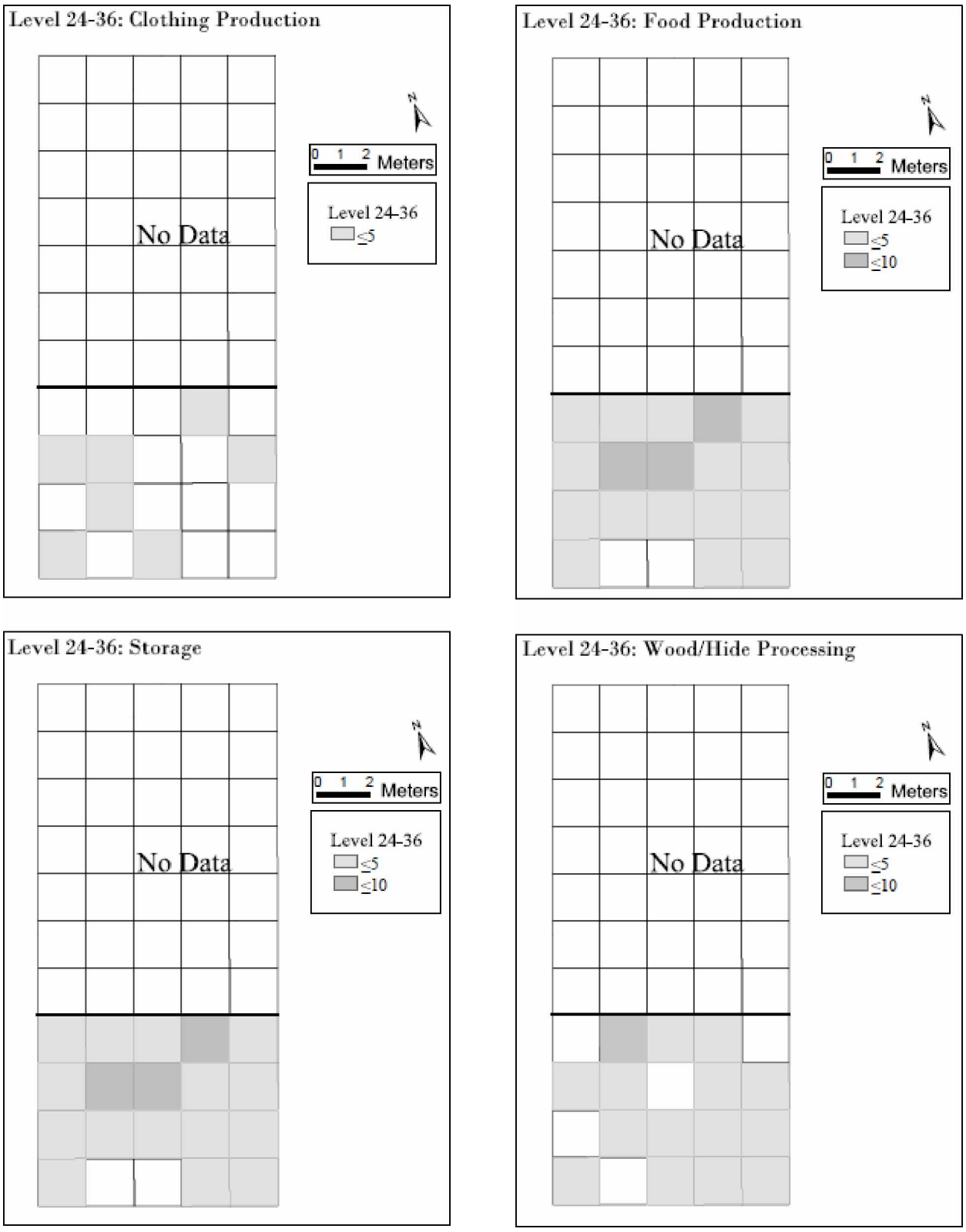

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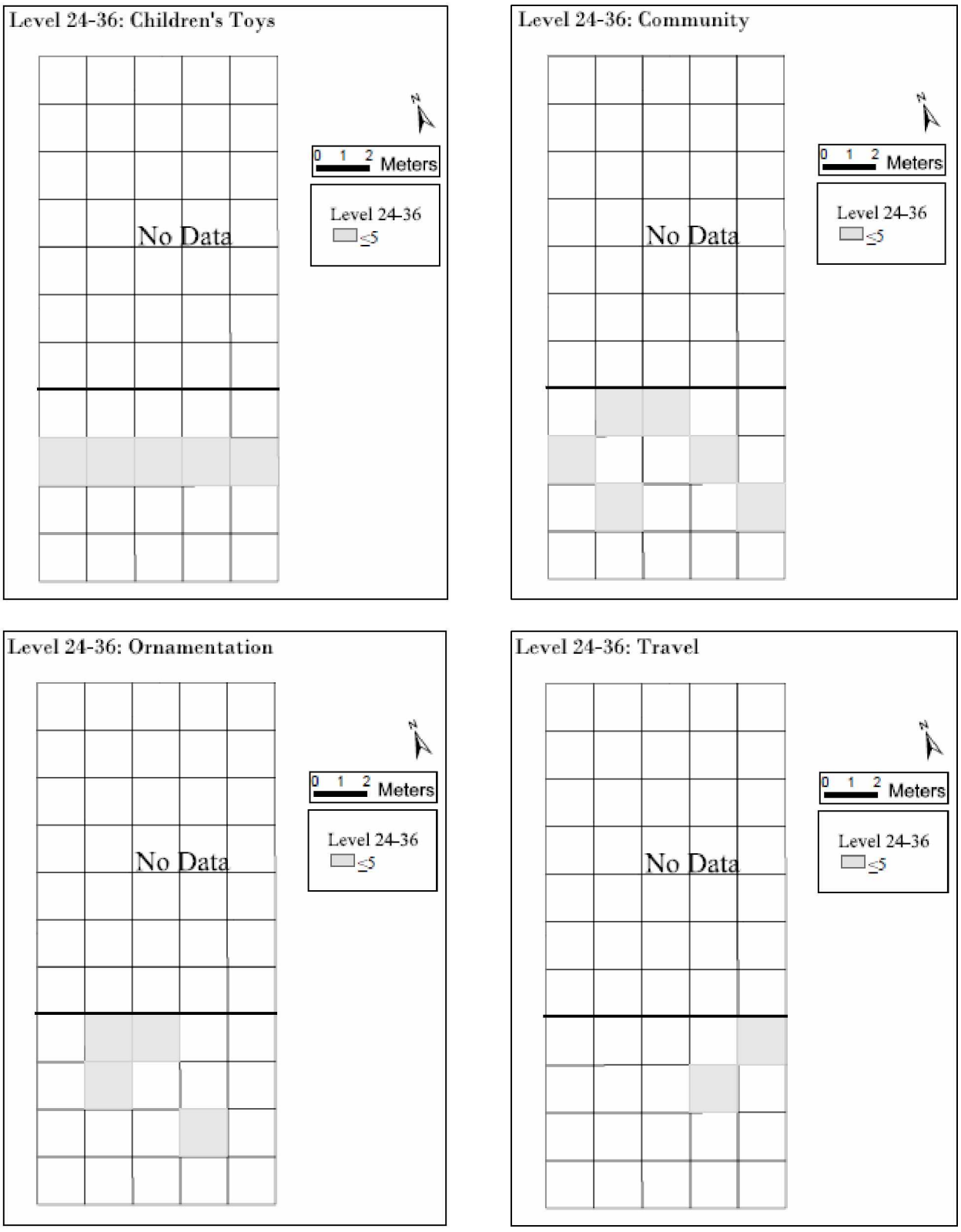

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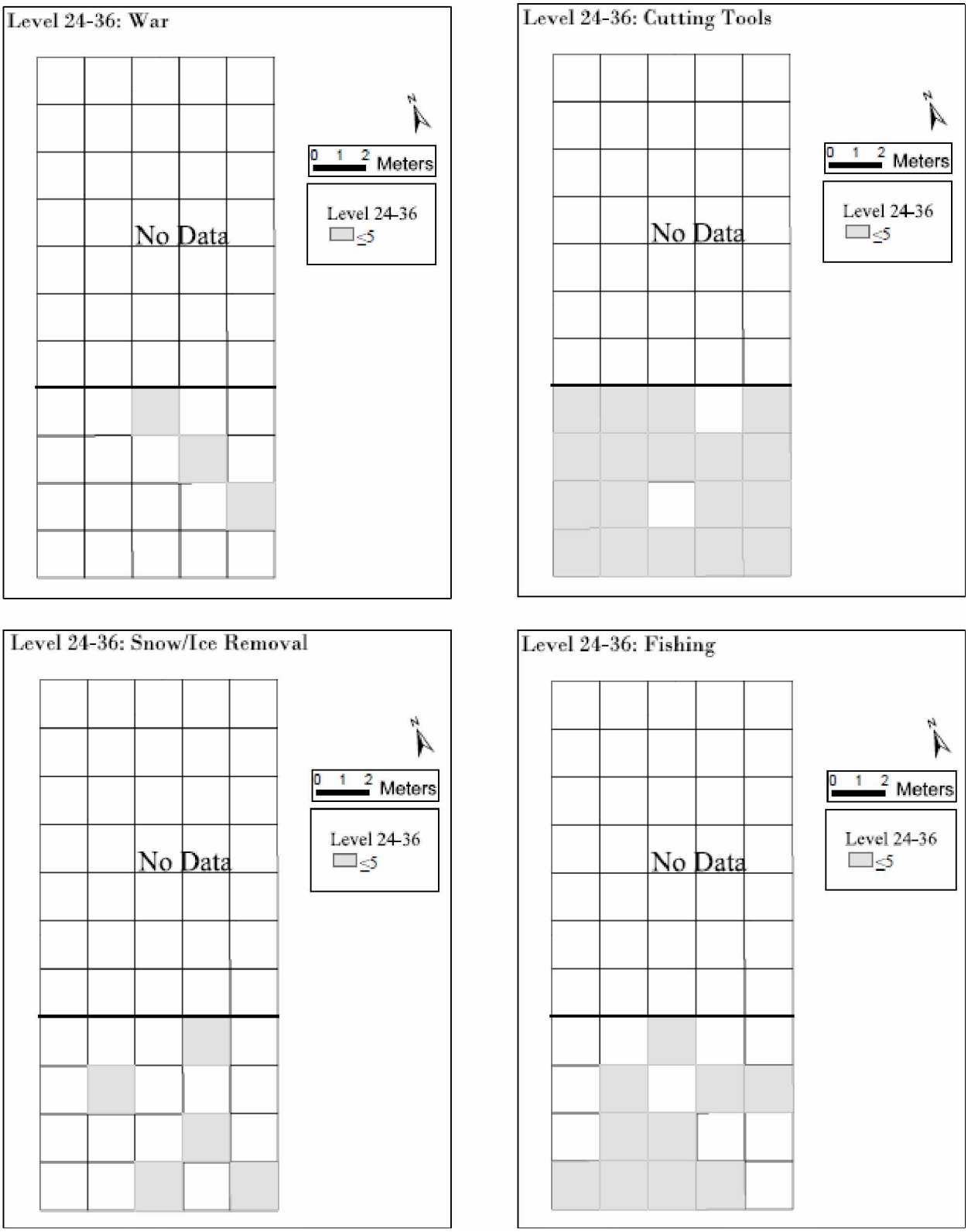

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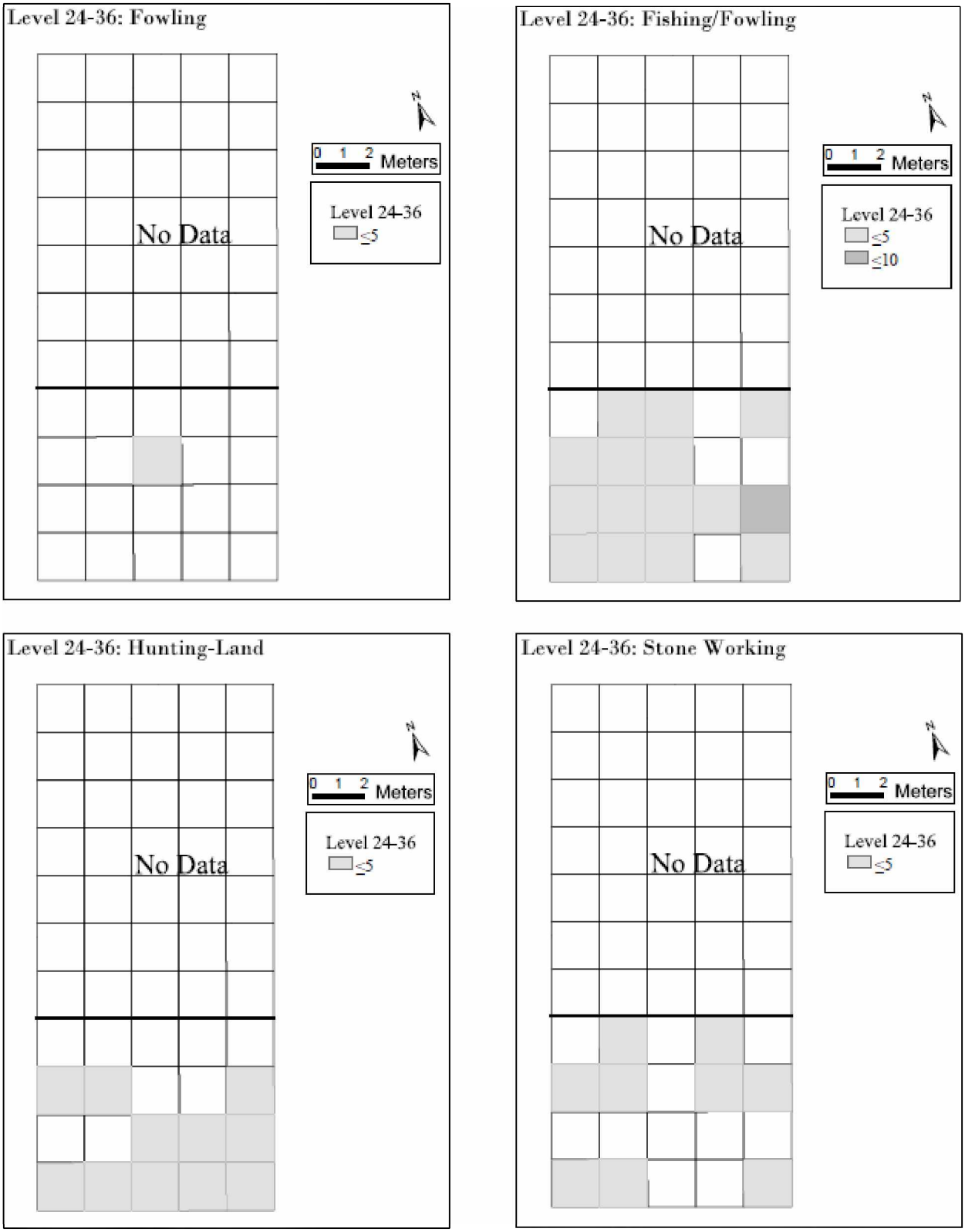

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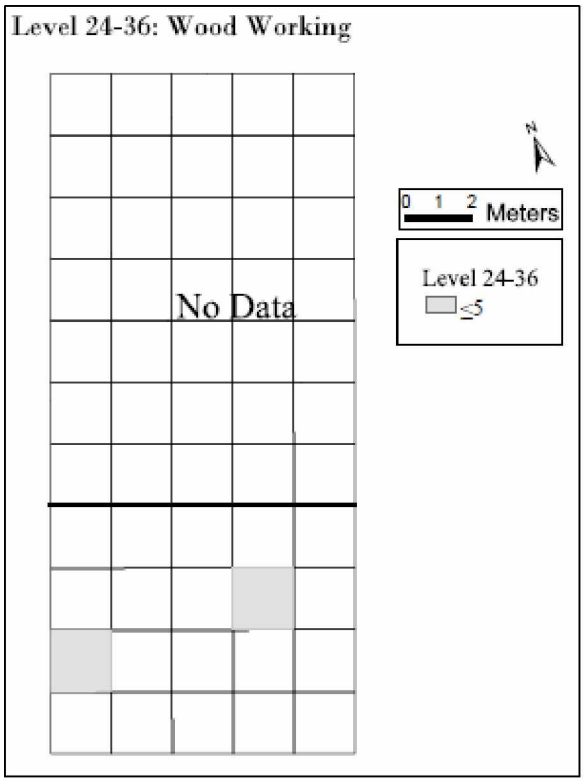

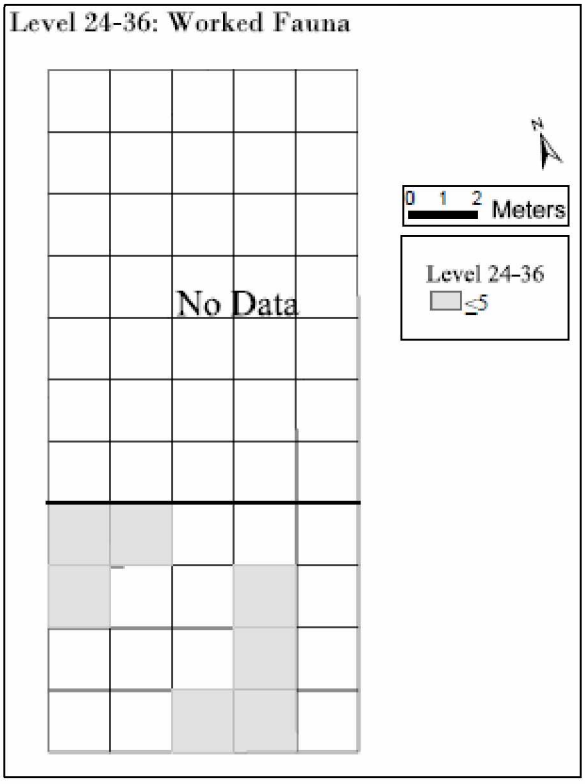

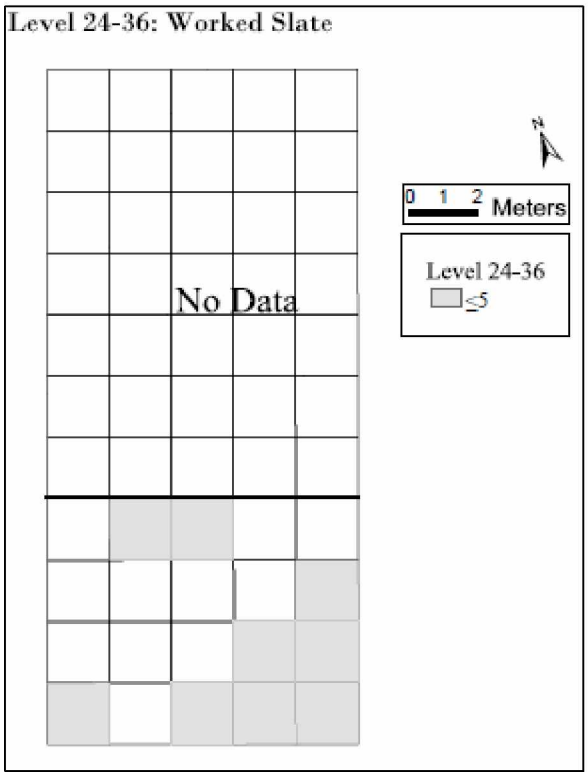

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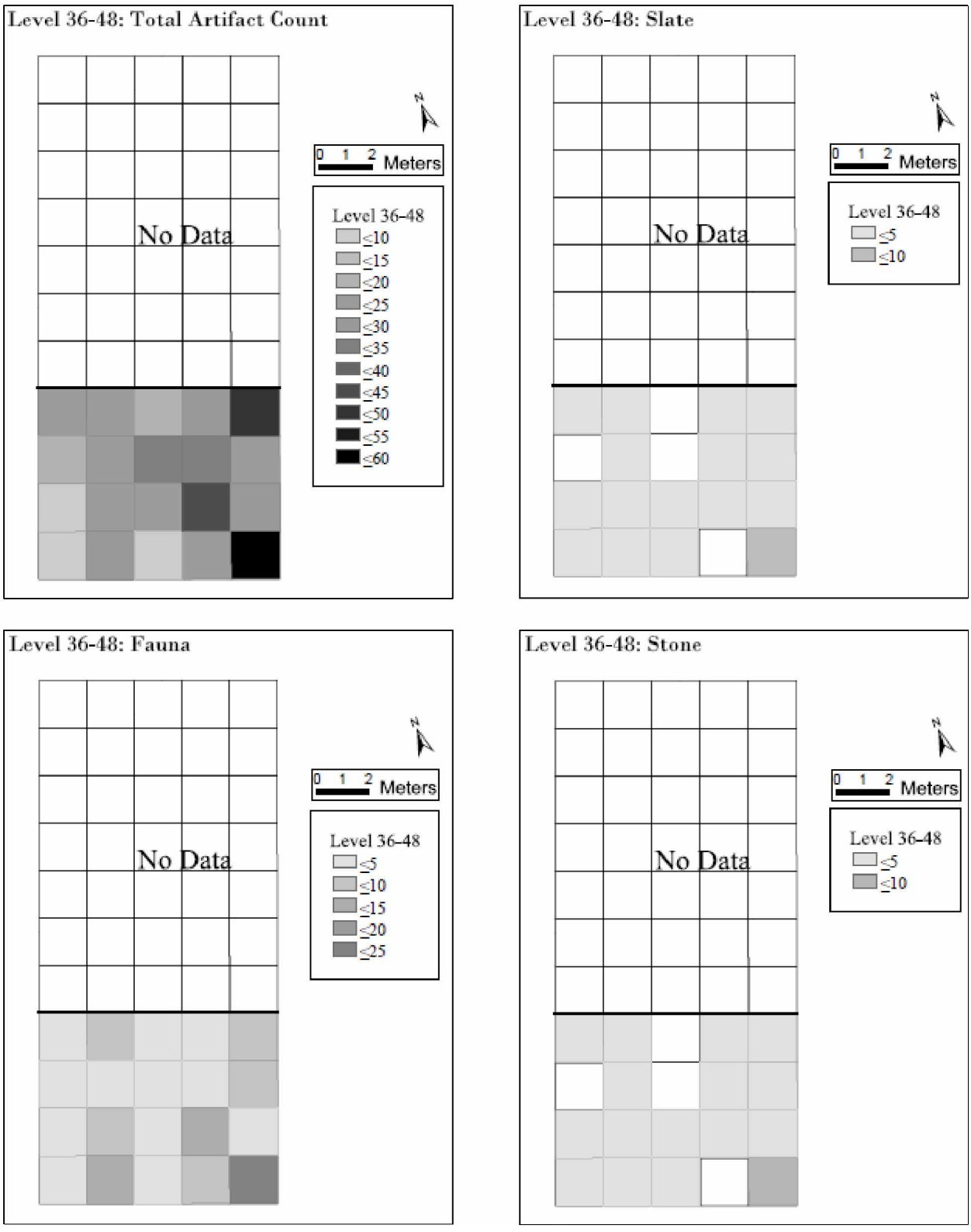

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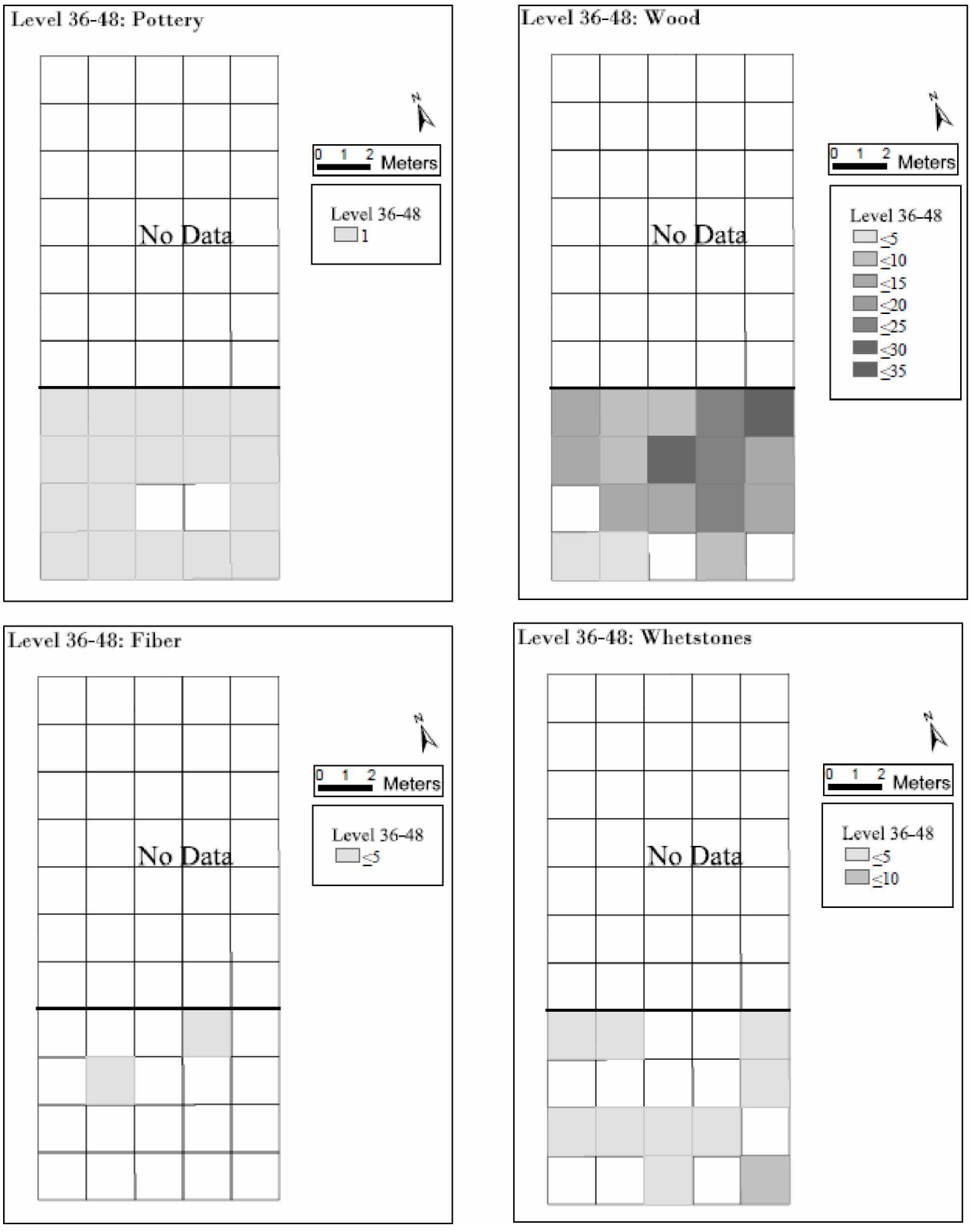

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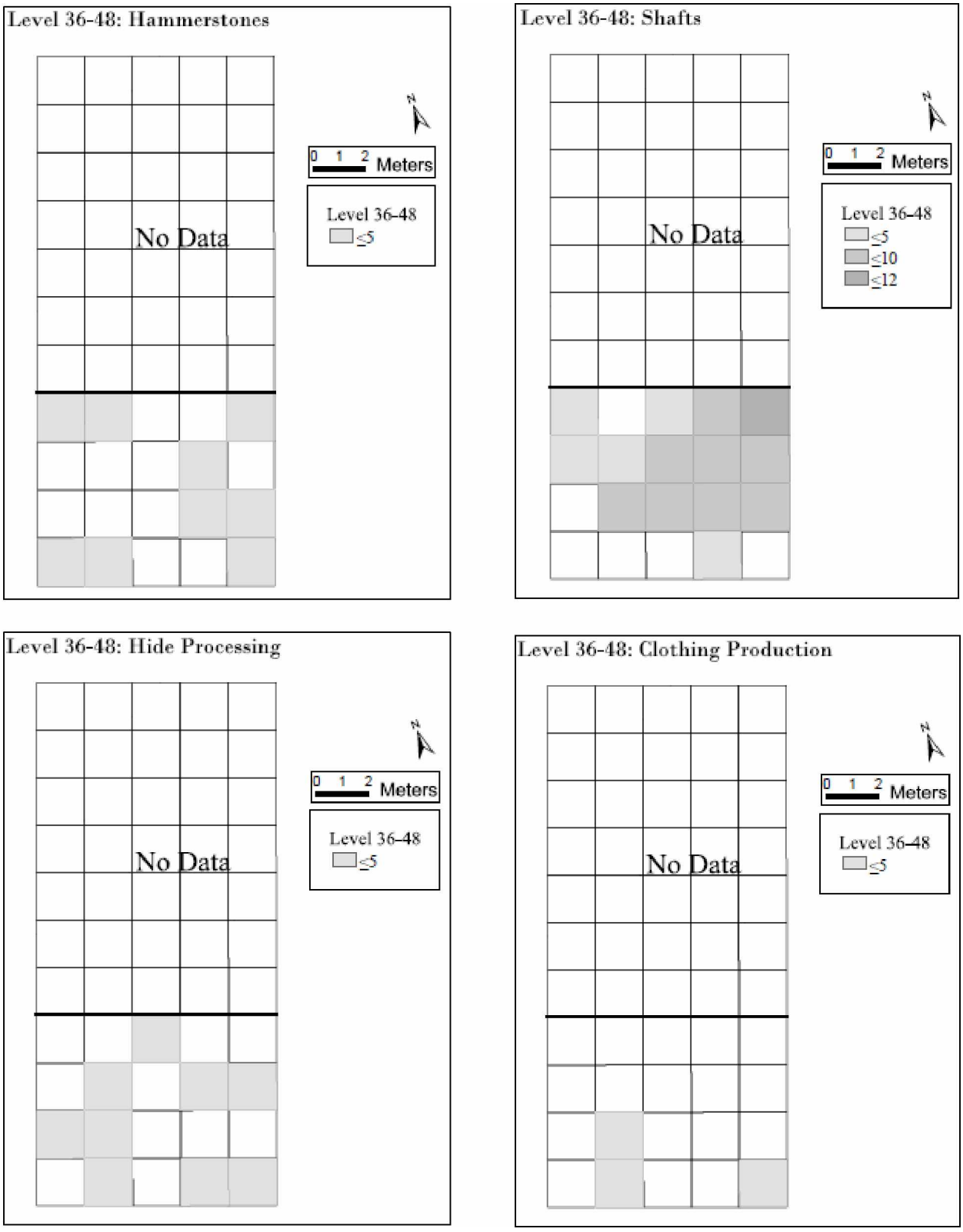

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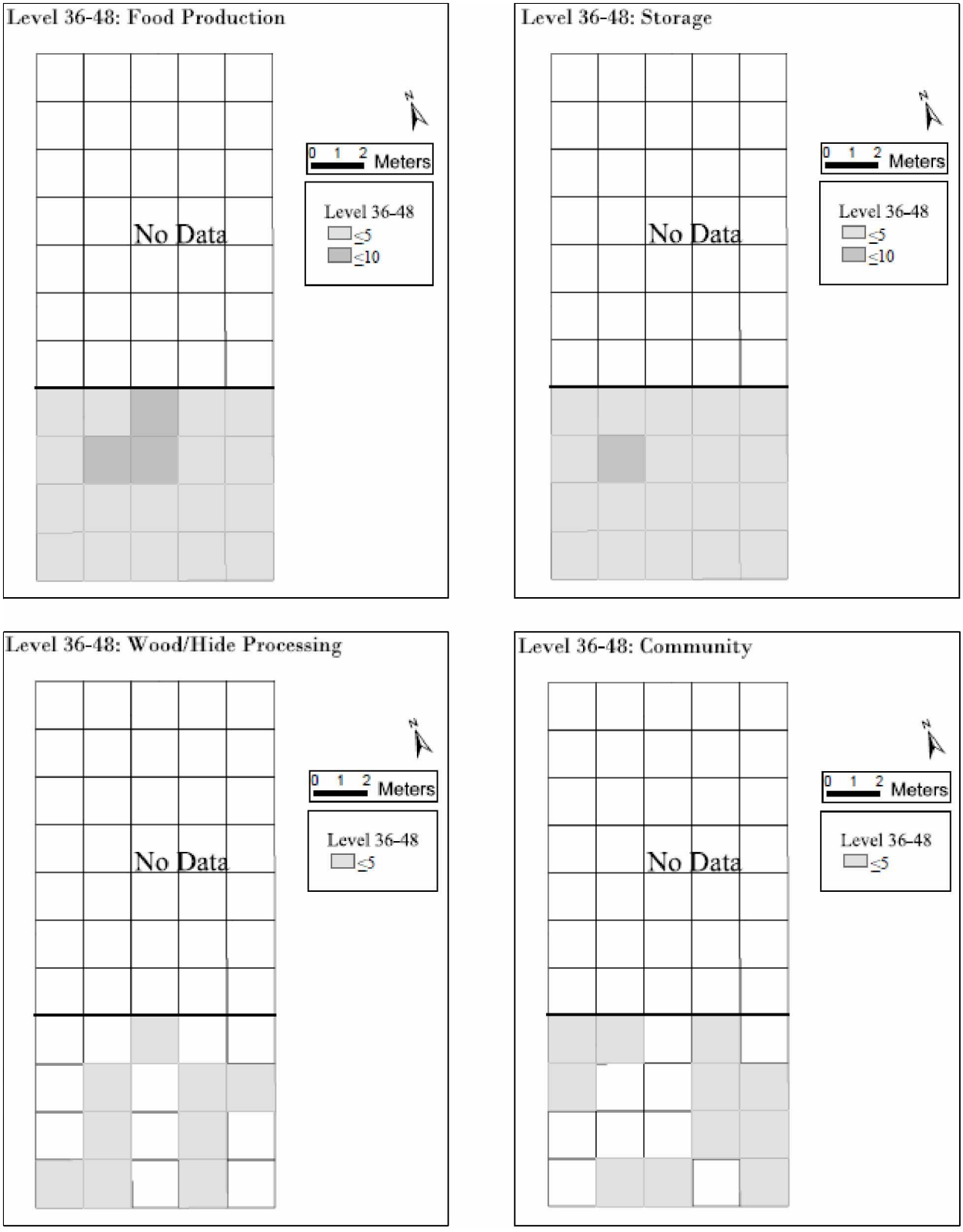

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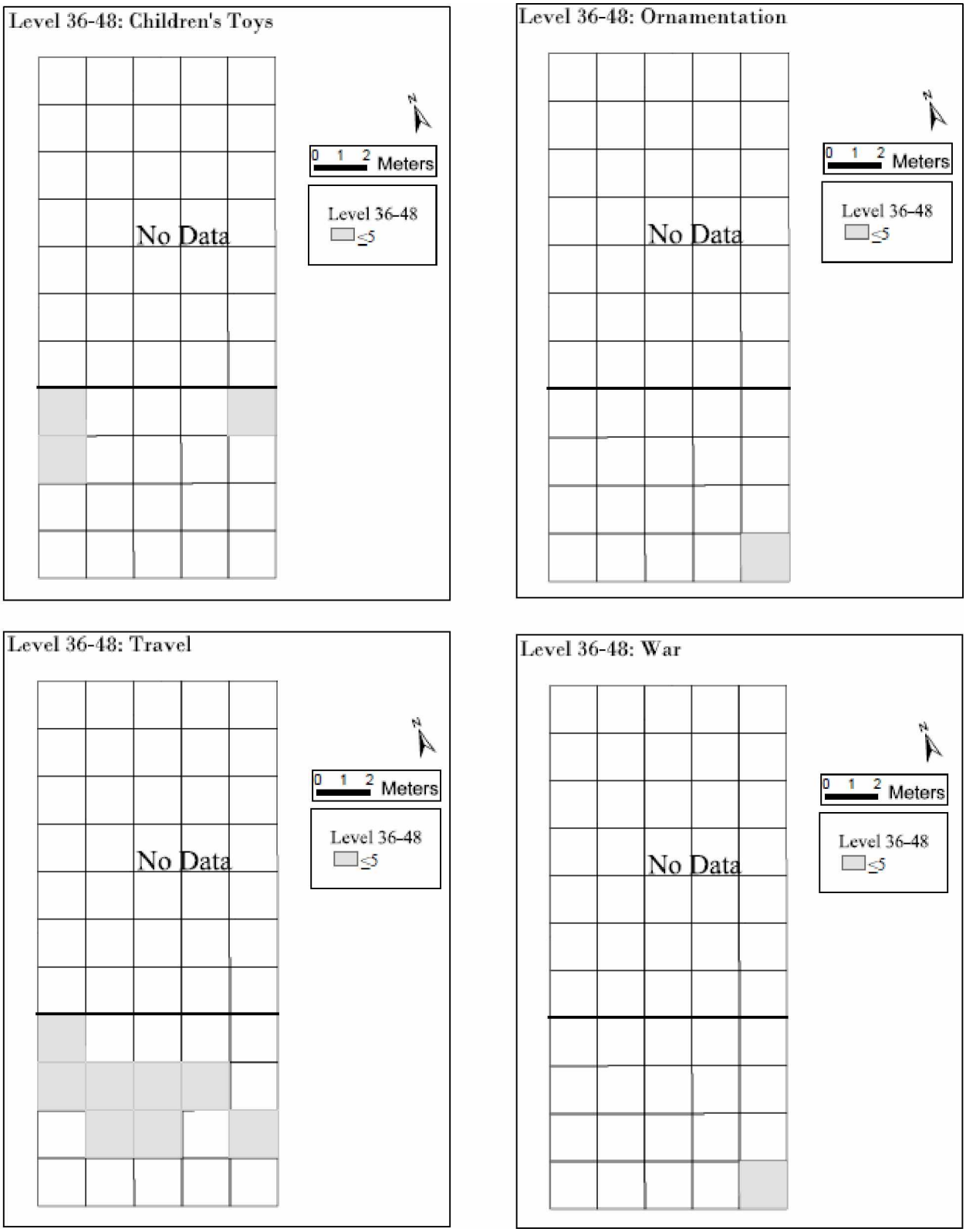

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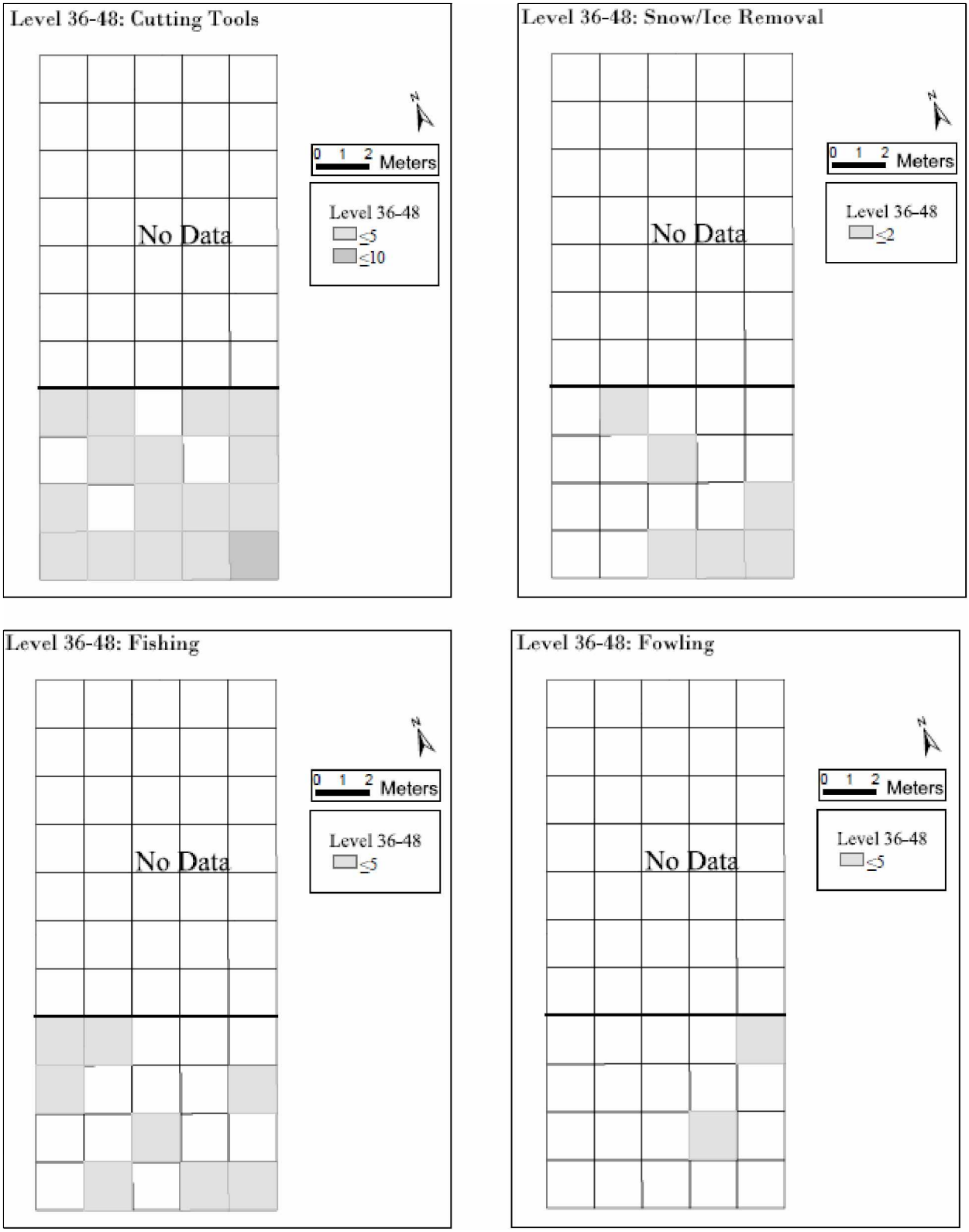

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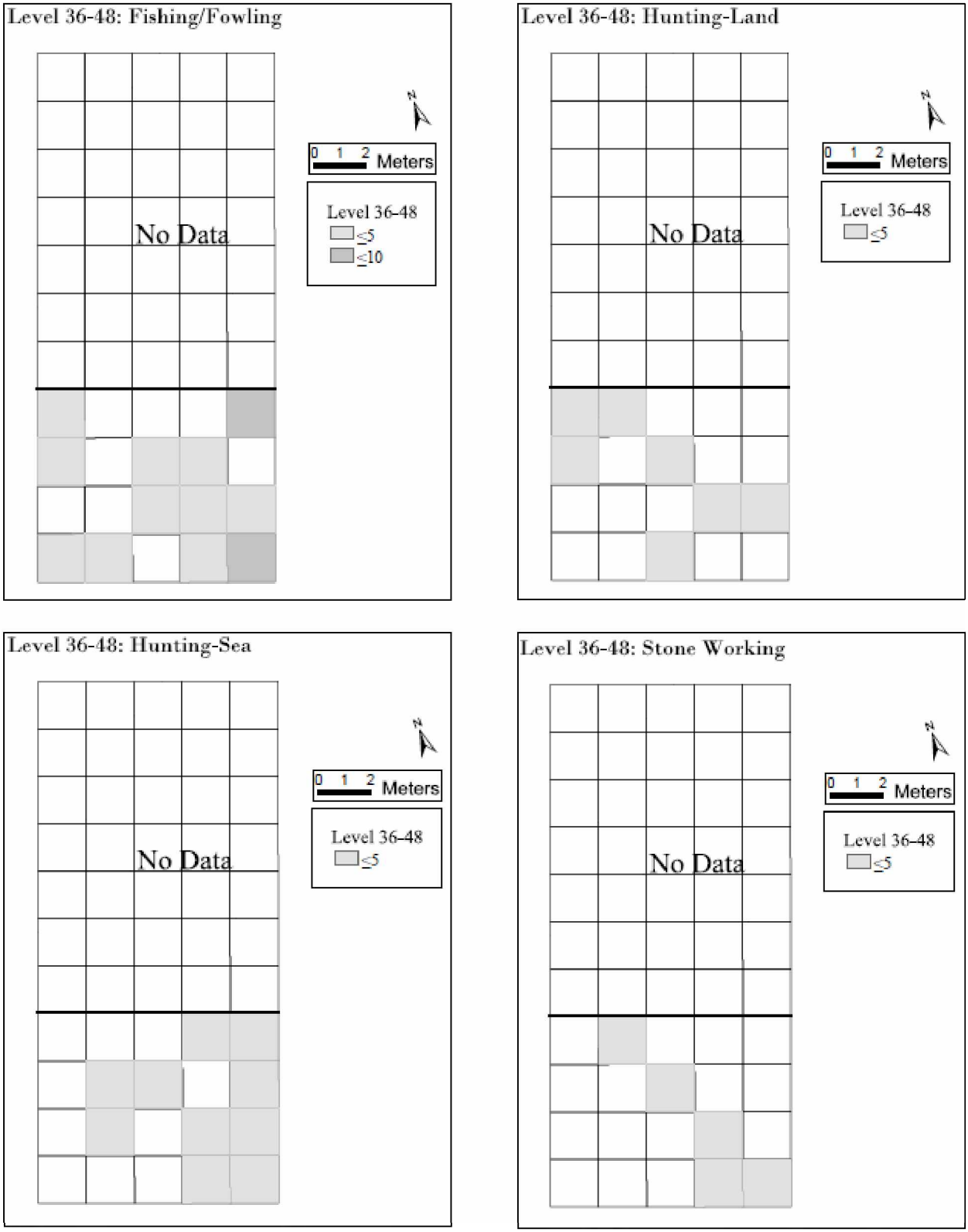

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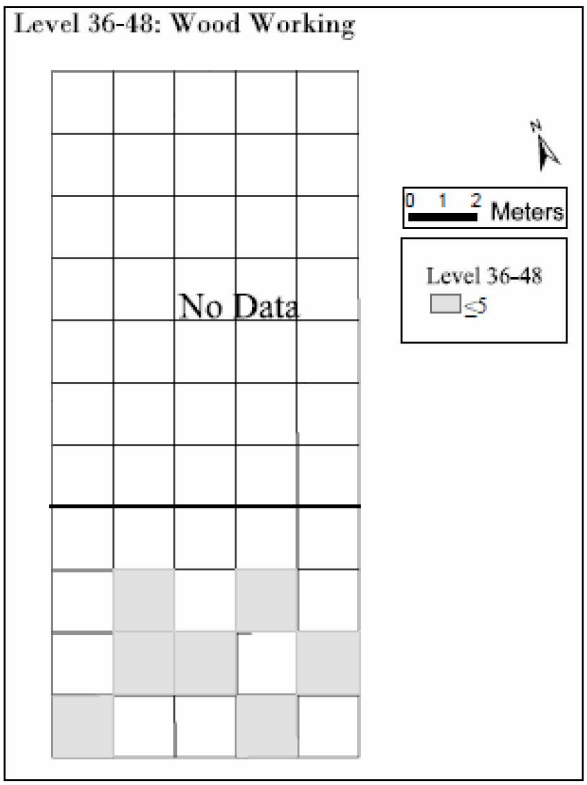

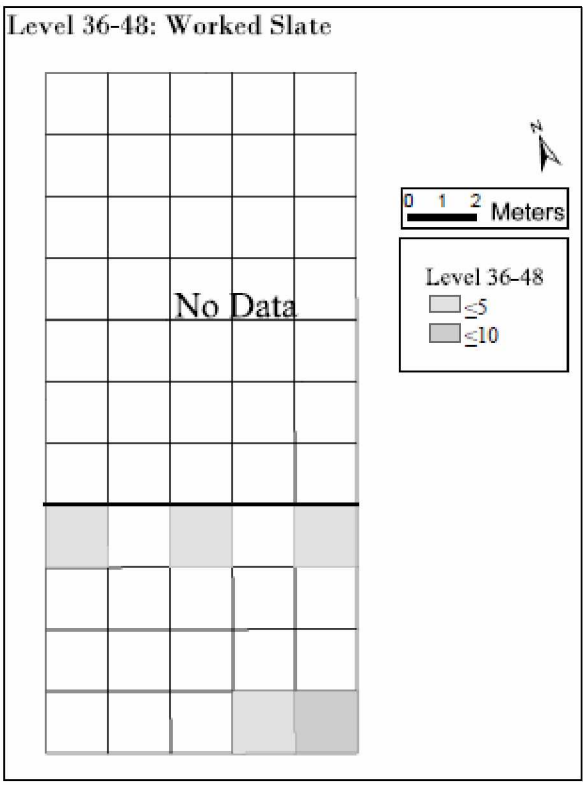

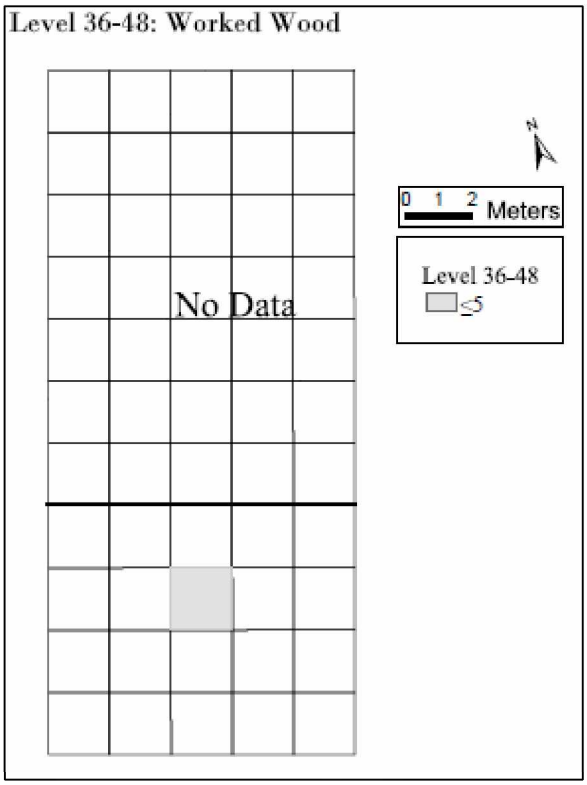

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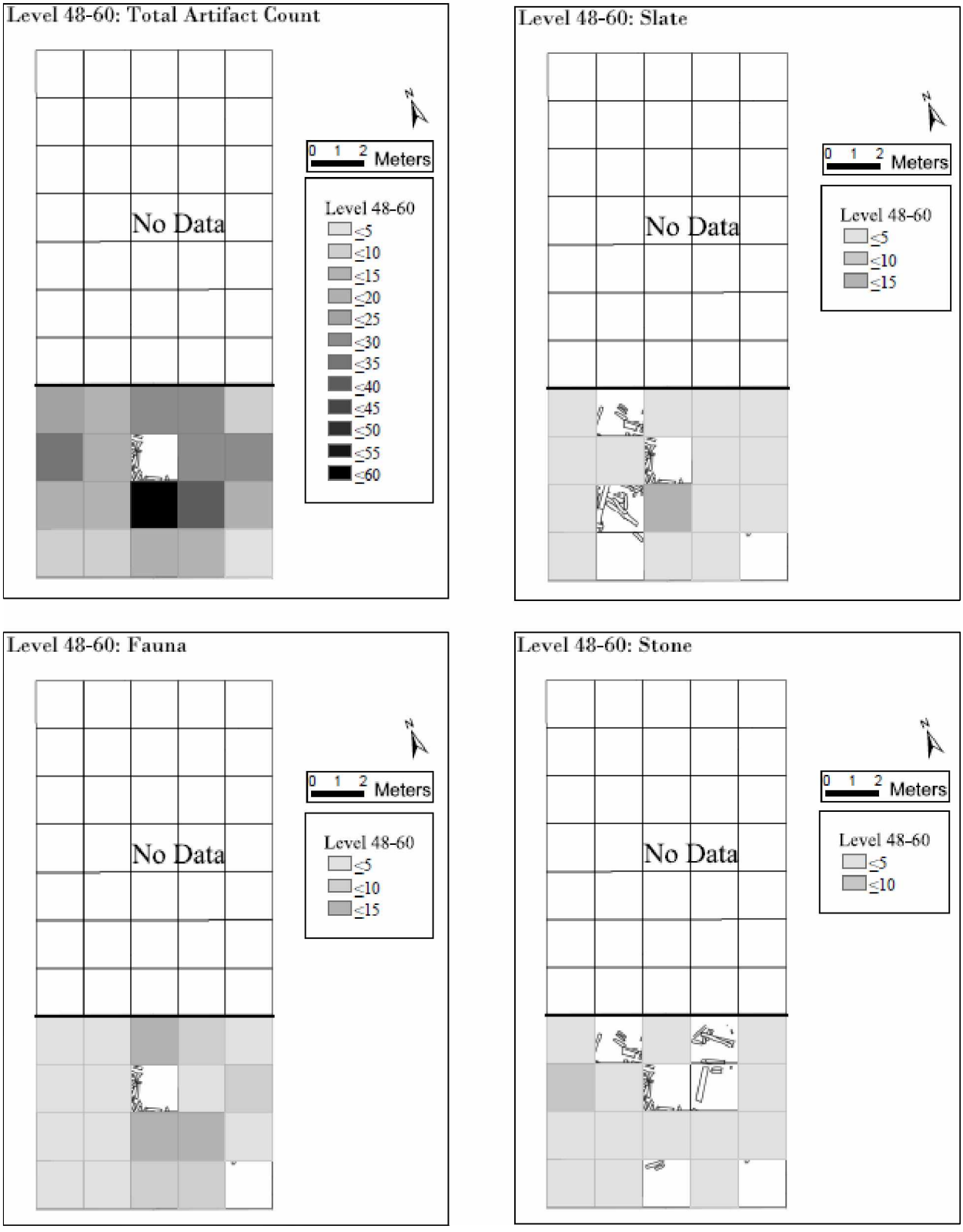

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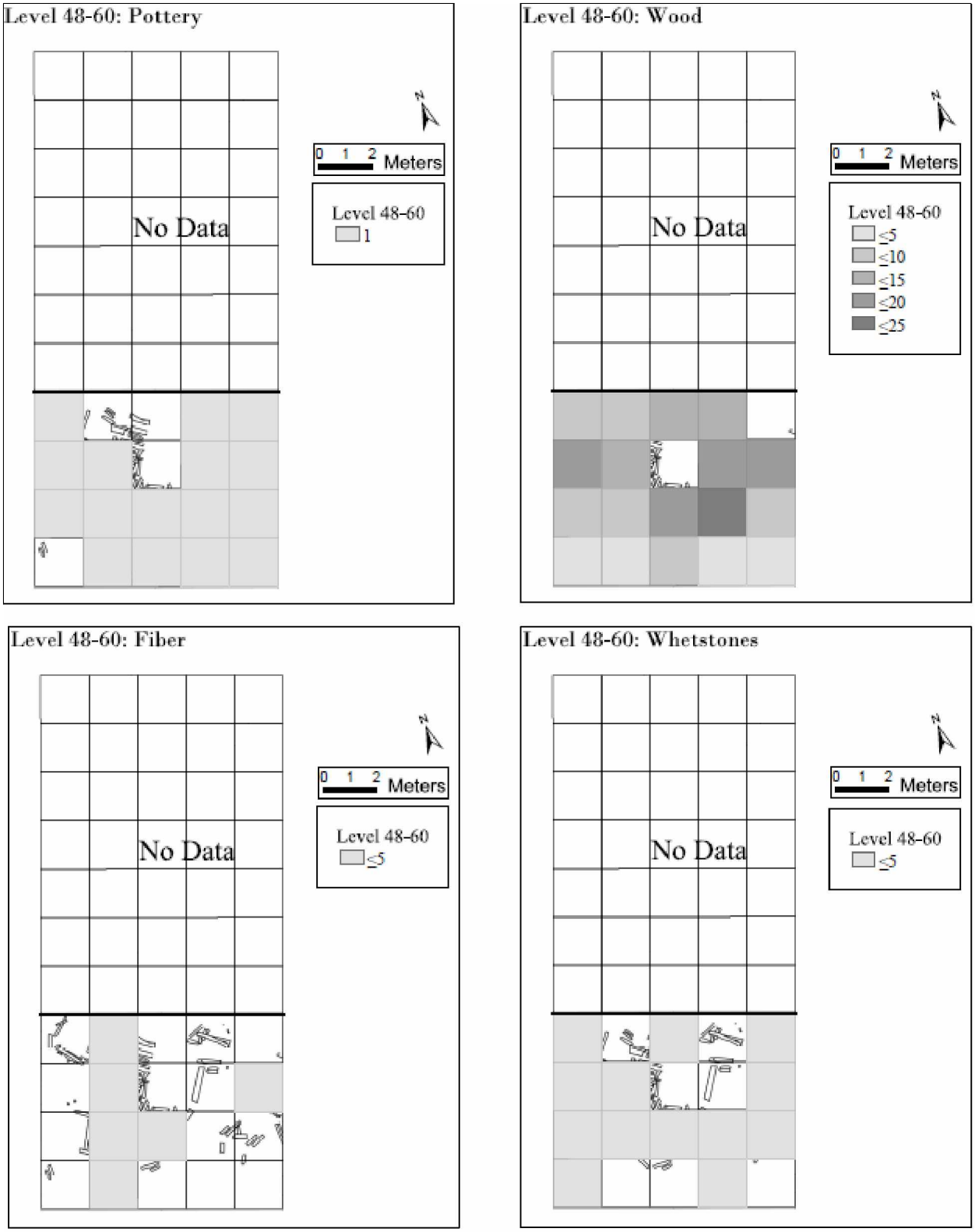

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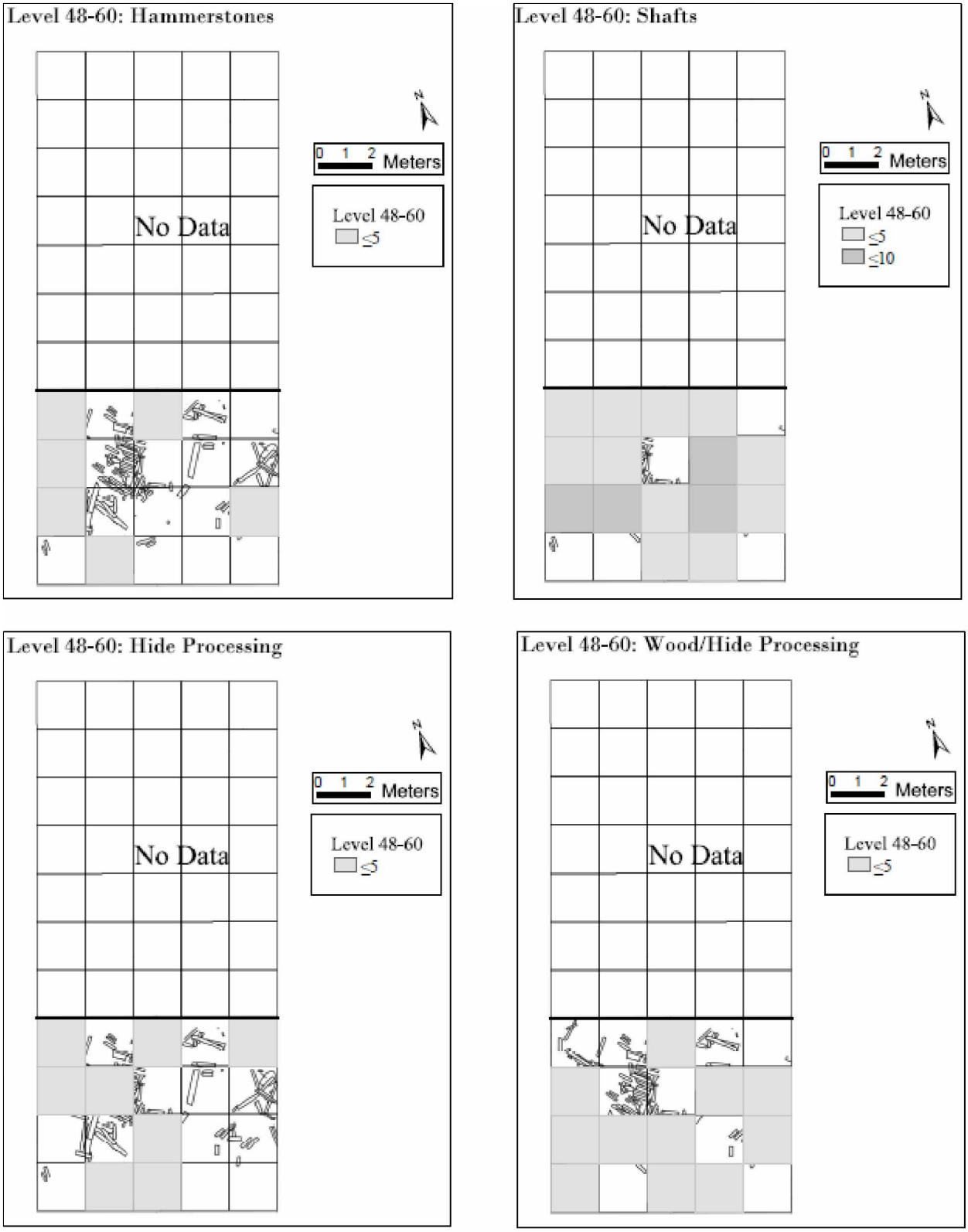
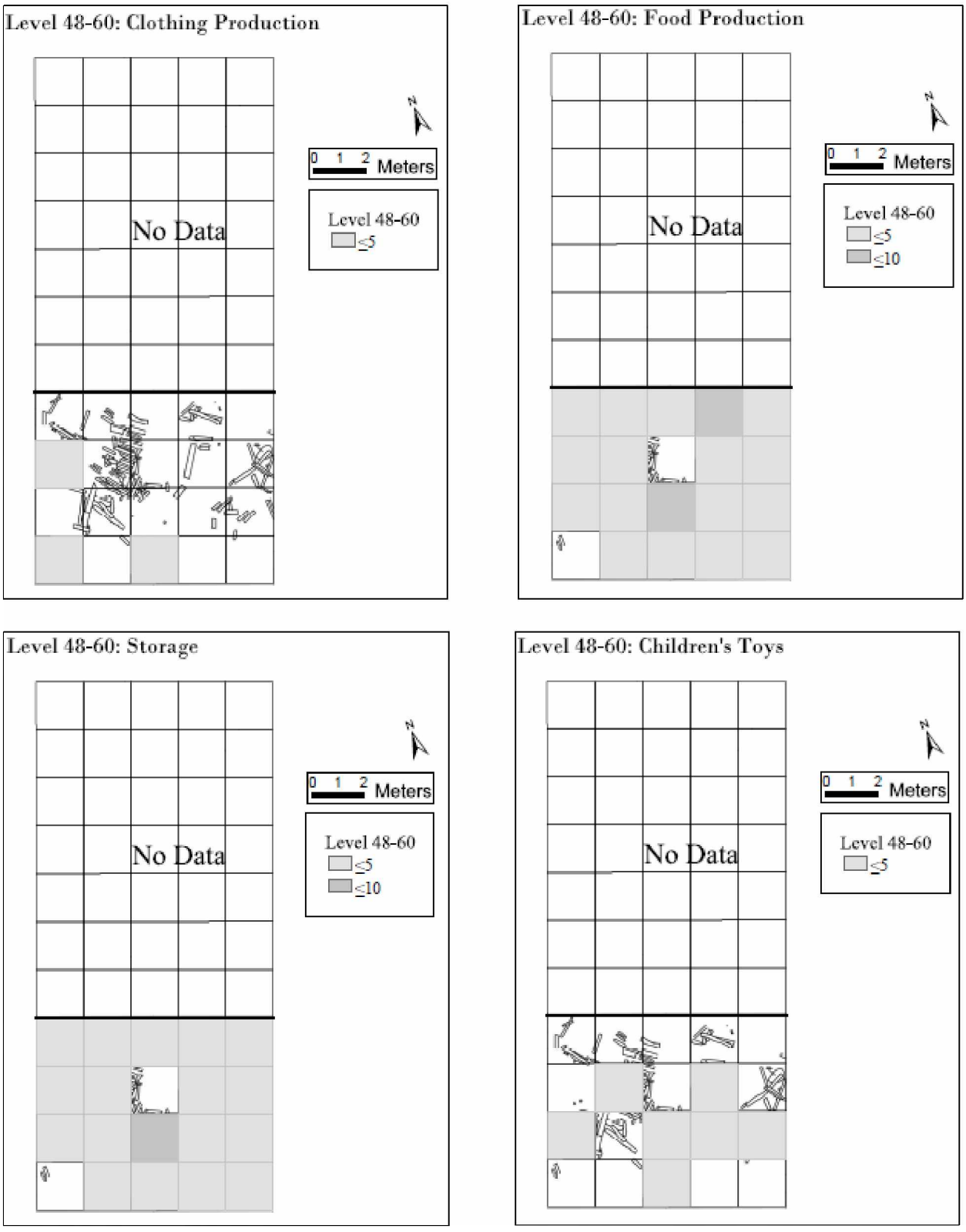


Figure A. 6.1 Level 48-60 (in) Density Models and Wood Layer. Continues to Next Page.



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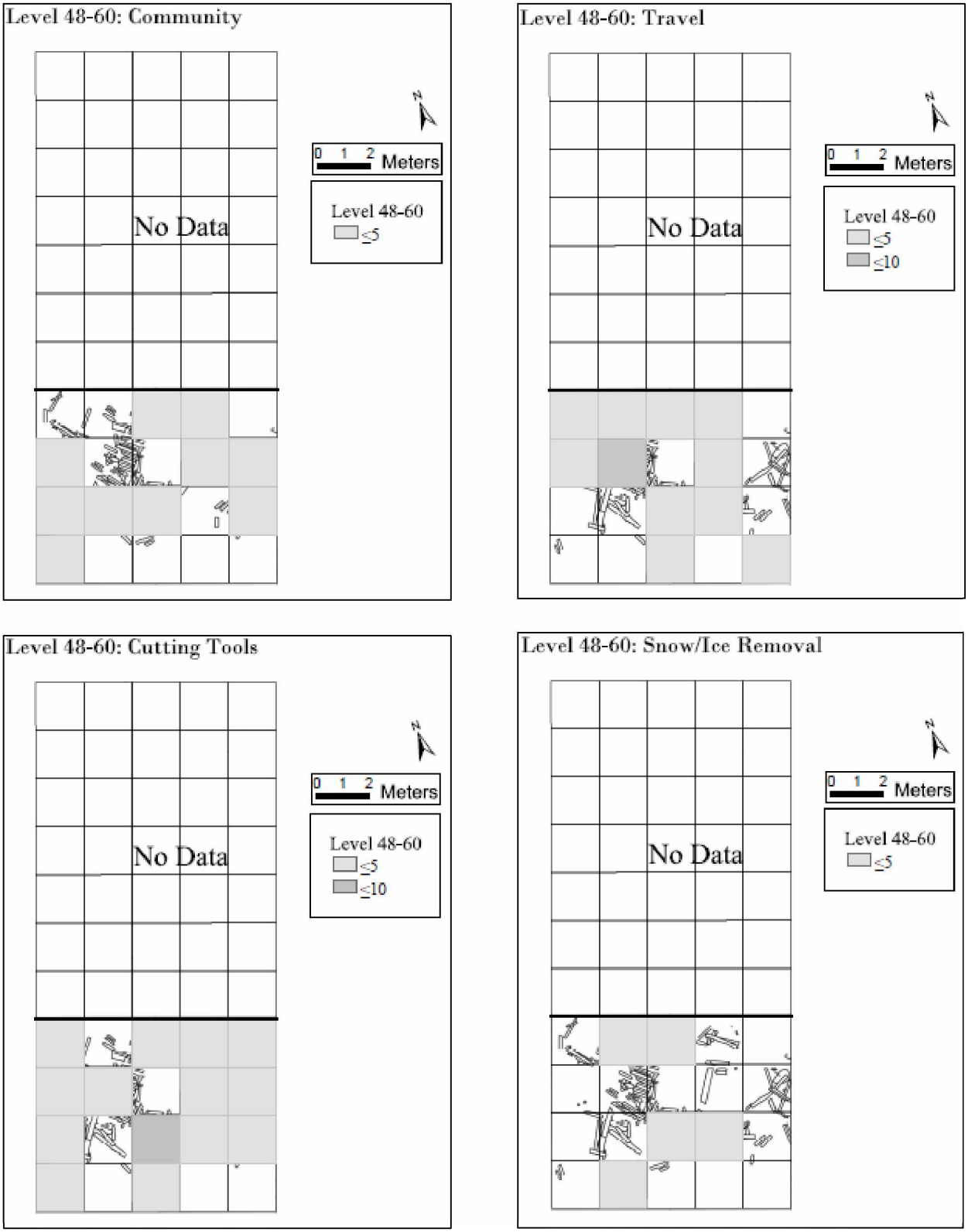
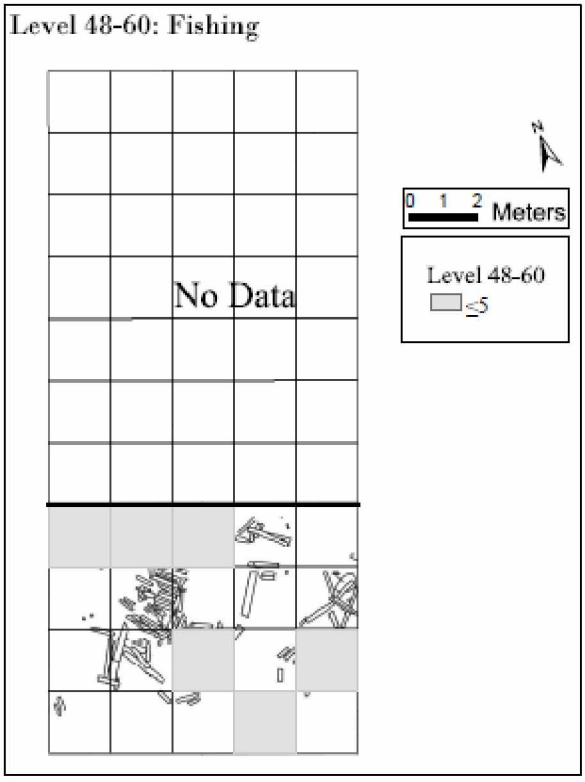
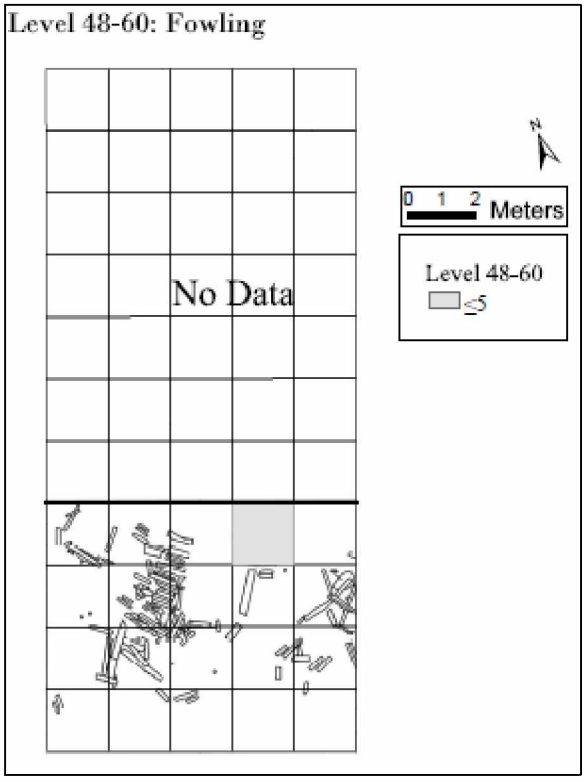
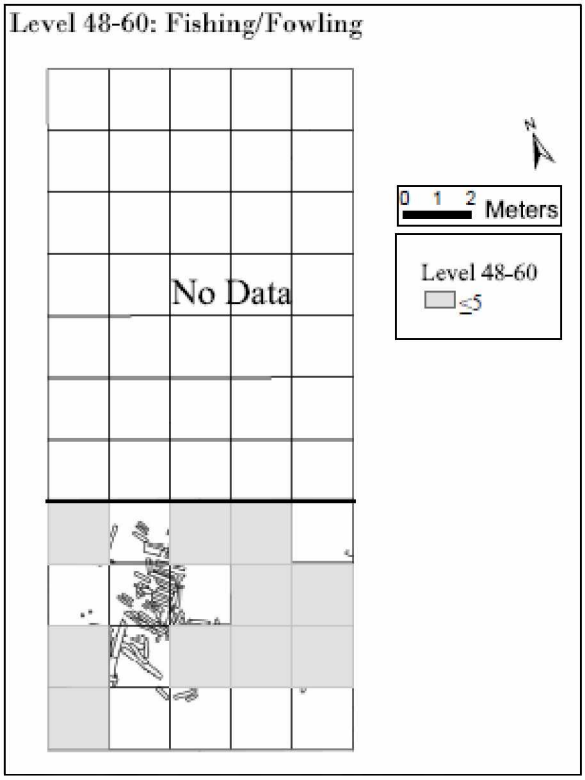


Figure A. 6.1 Level 48-60 (in) Density Models and Wood Layer. Continues to Next Page.







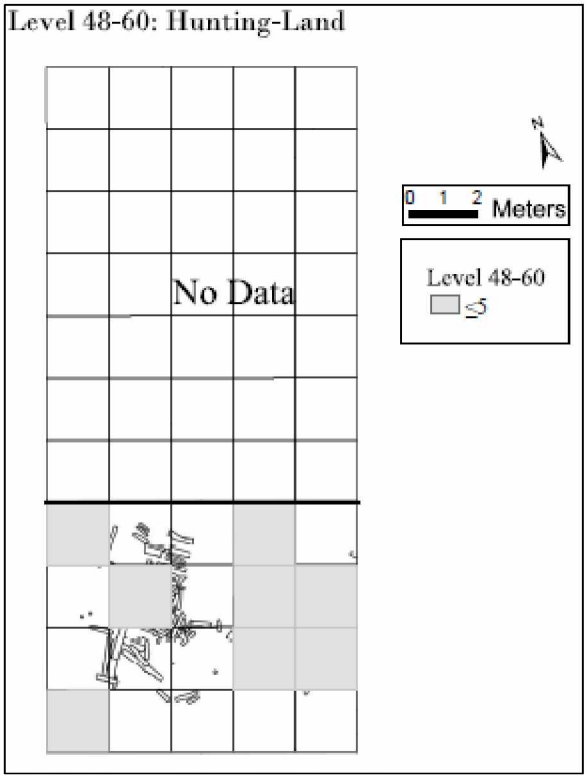


Figure A. 6.1 Level 48-60 (in) Density Models and Wood Layer. Continues to Next Page.

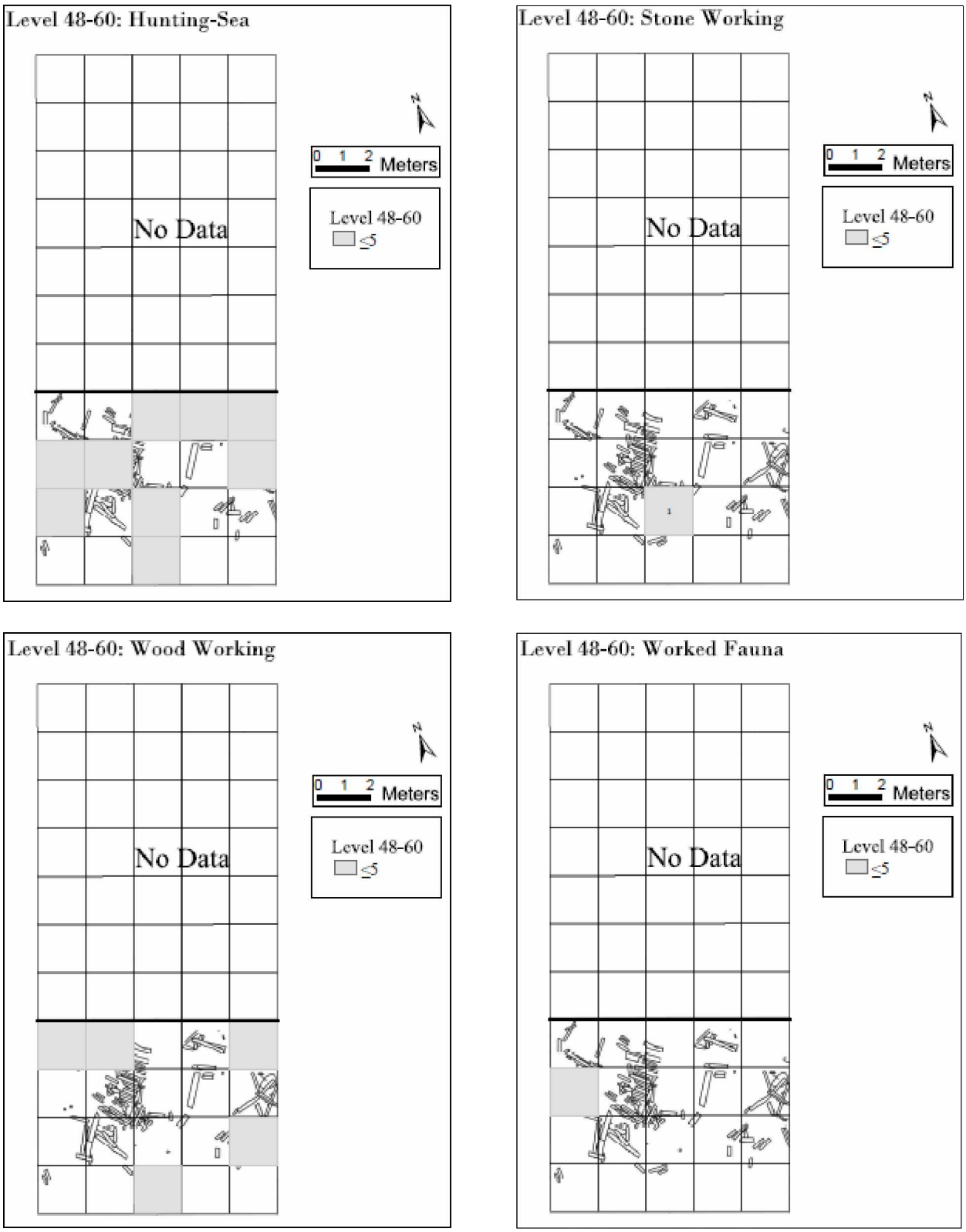


Figure A. 6.1 Level 48-60 (in) Density Models and Wood Layer. Continues to Next Page.

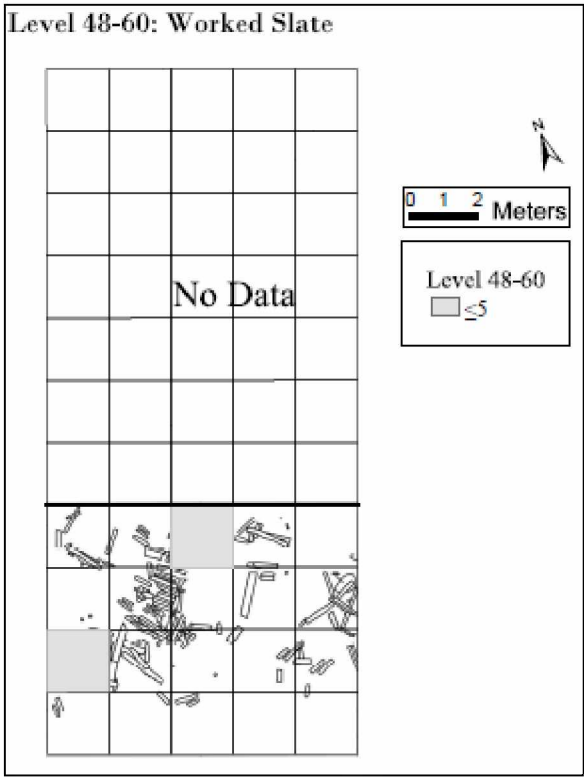


Figure A. 6.8 Level 48-60 (in) Density Models and Wood Layer.

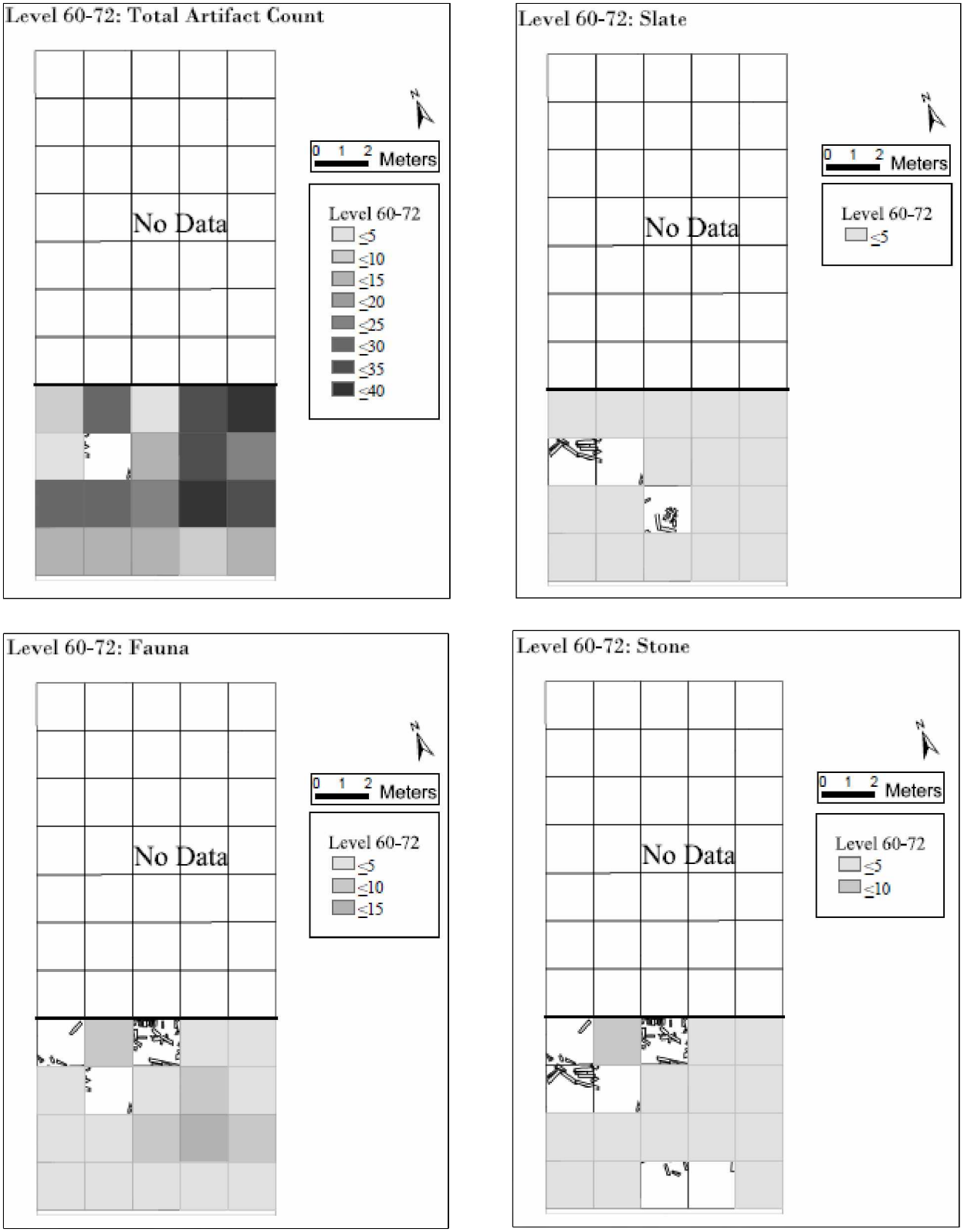
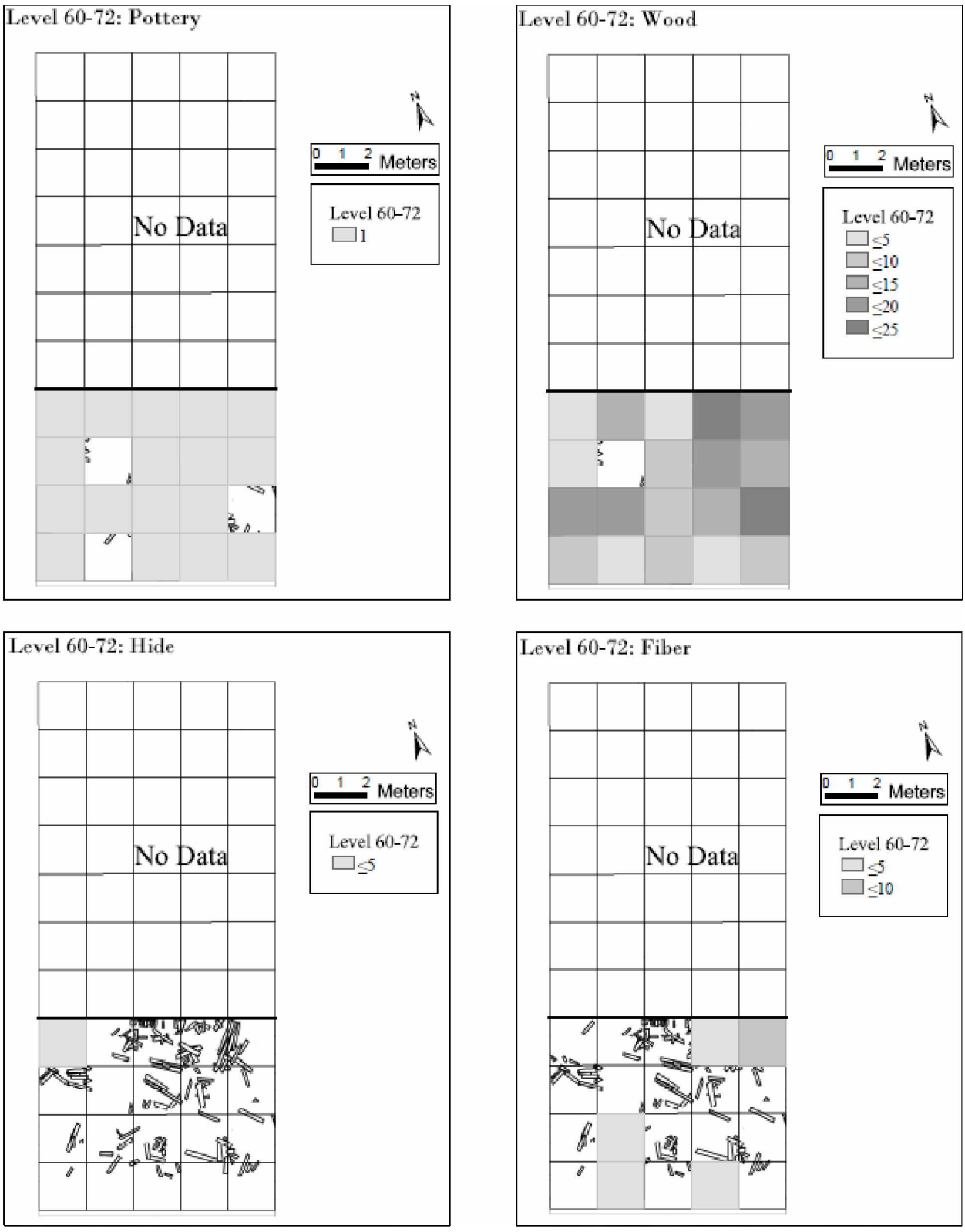


Figure A. 7.1 Level 60-72 (in) Density Models and Wood Layer. Continues to Next Page.



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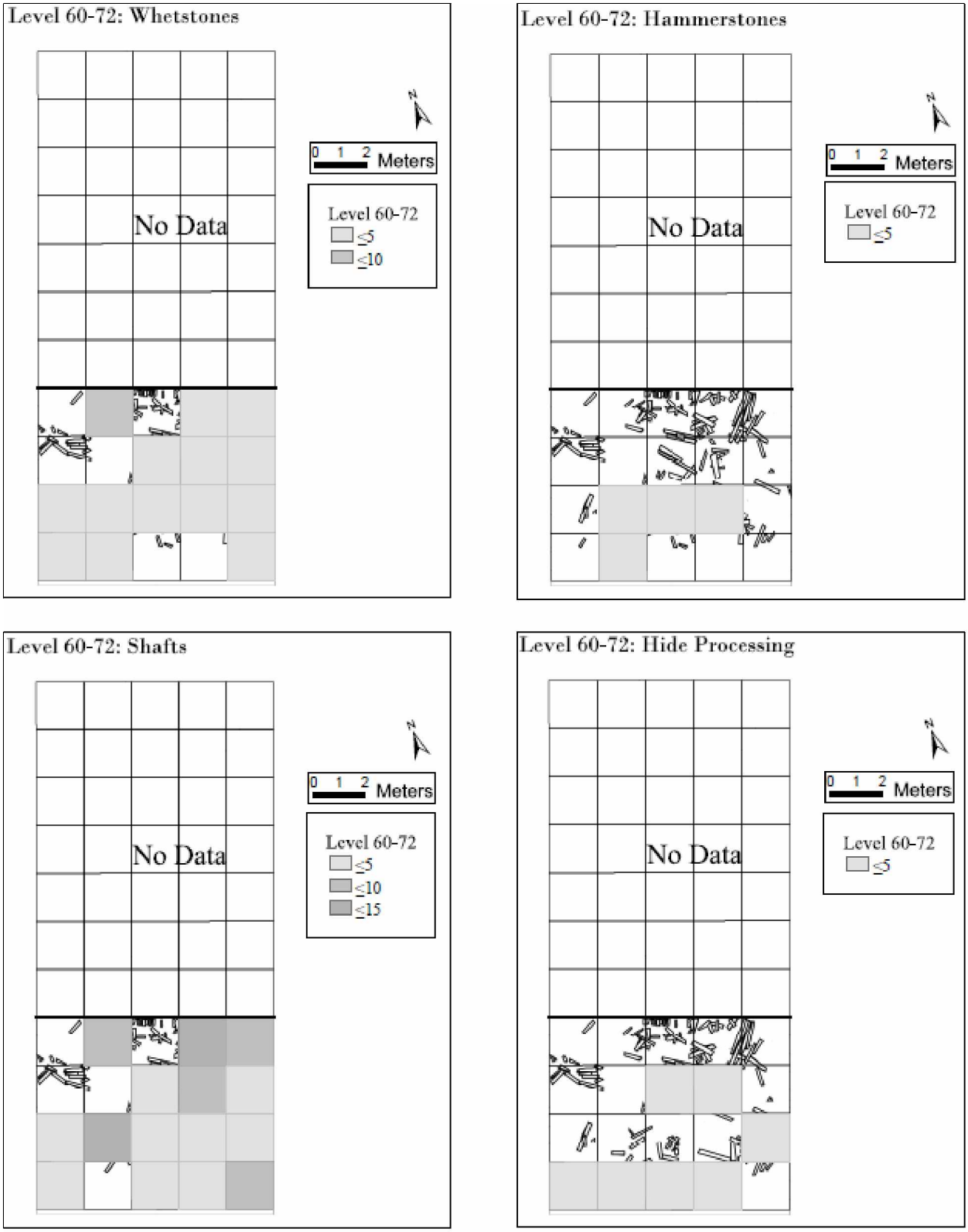


Figure A. 7.1 Level 60-72 (in) Density Models and Wood Layer. Continues to Next Page.

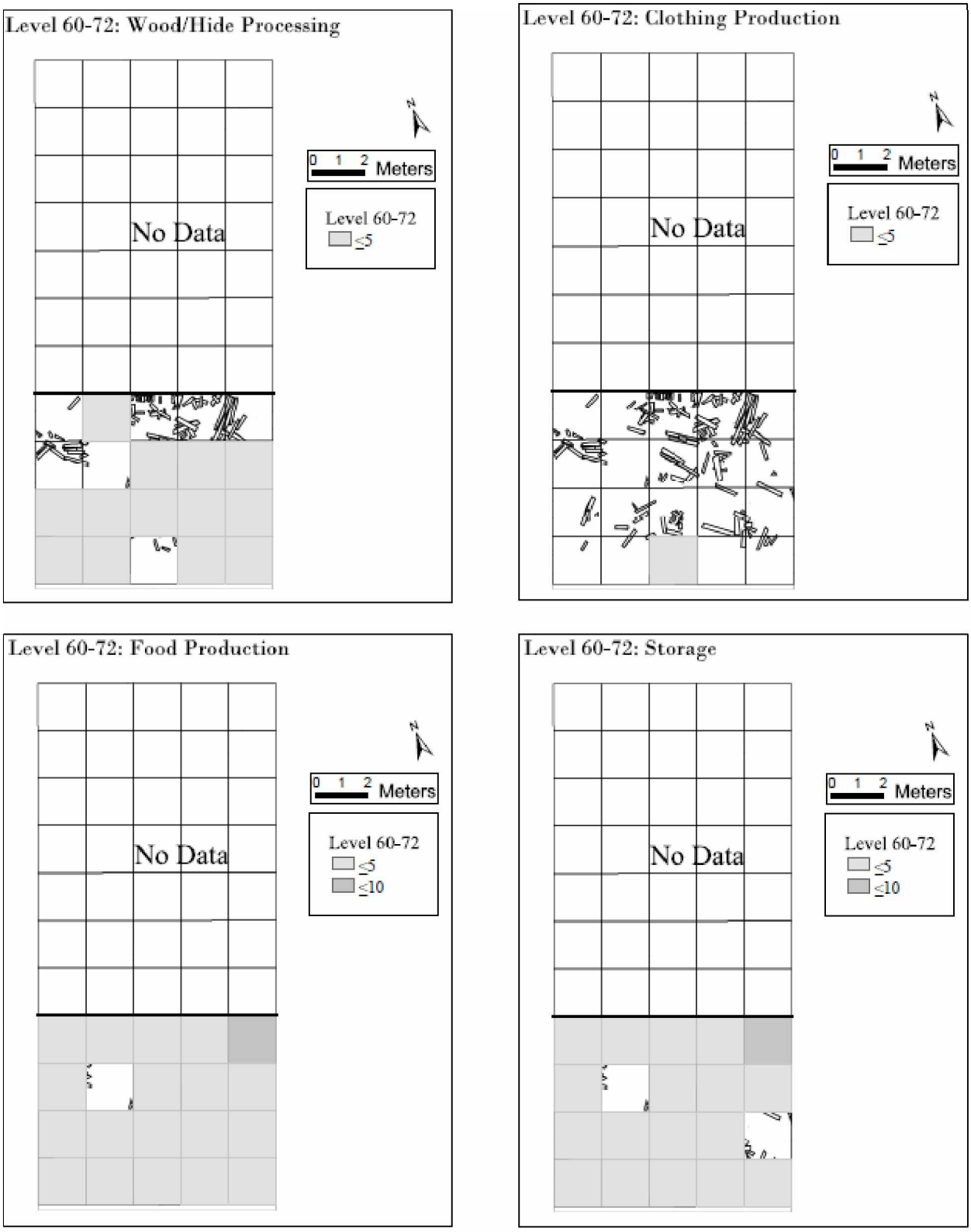
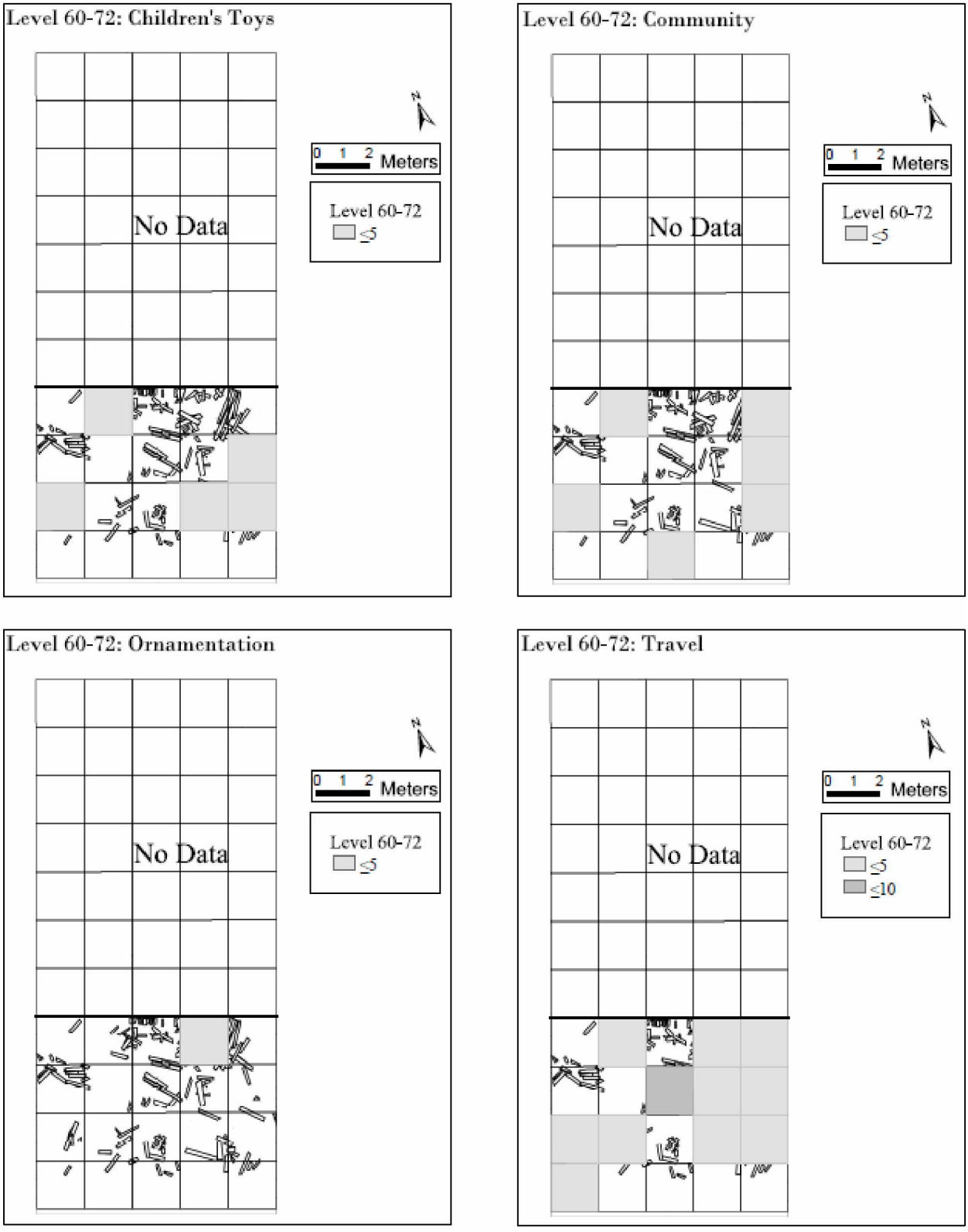


Figure A. 7.1 Level 60-72 (in) Density Models and Wood Layer. Continues to Next Page.



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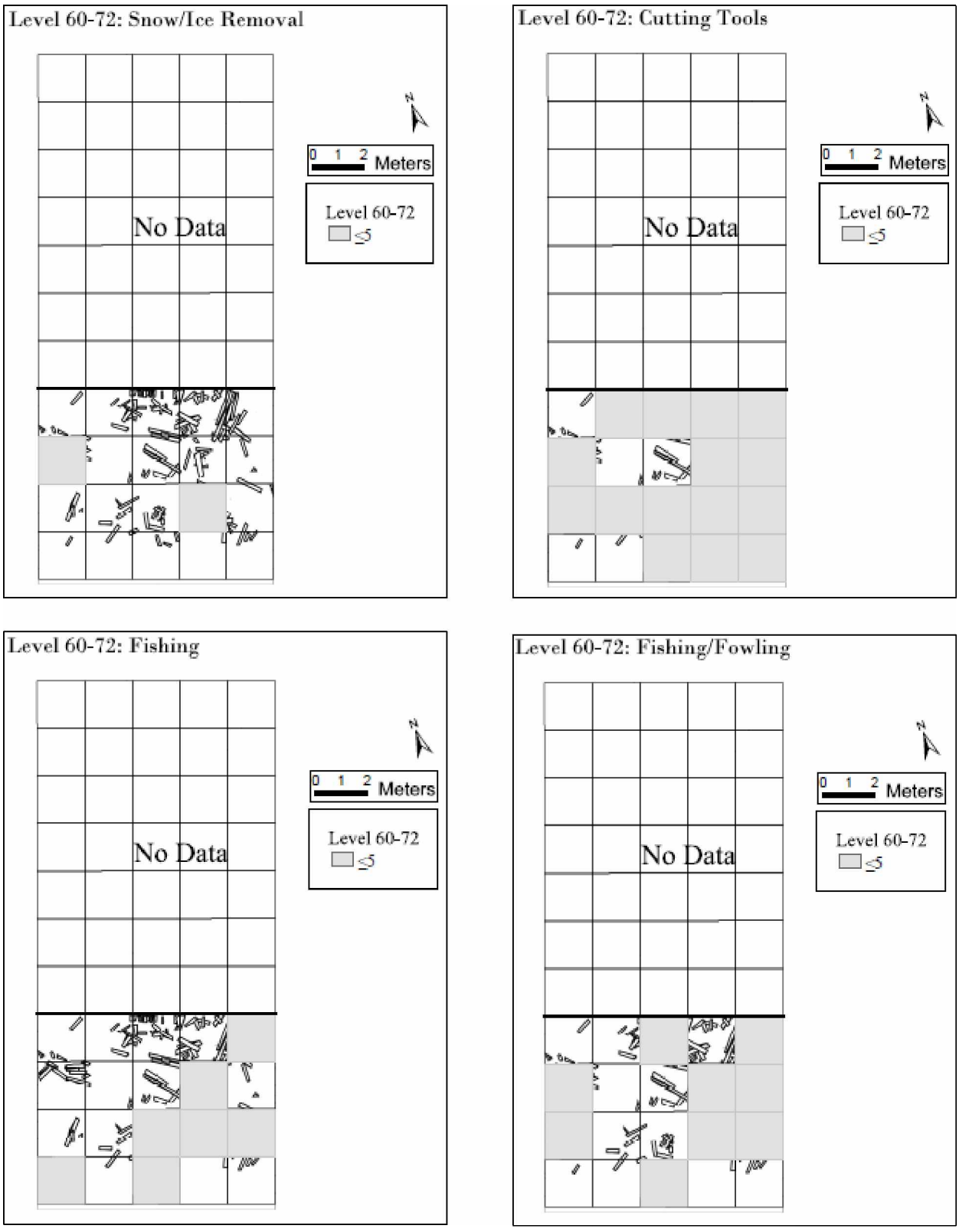

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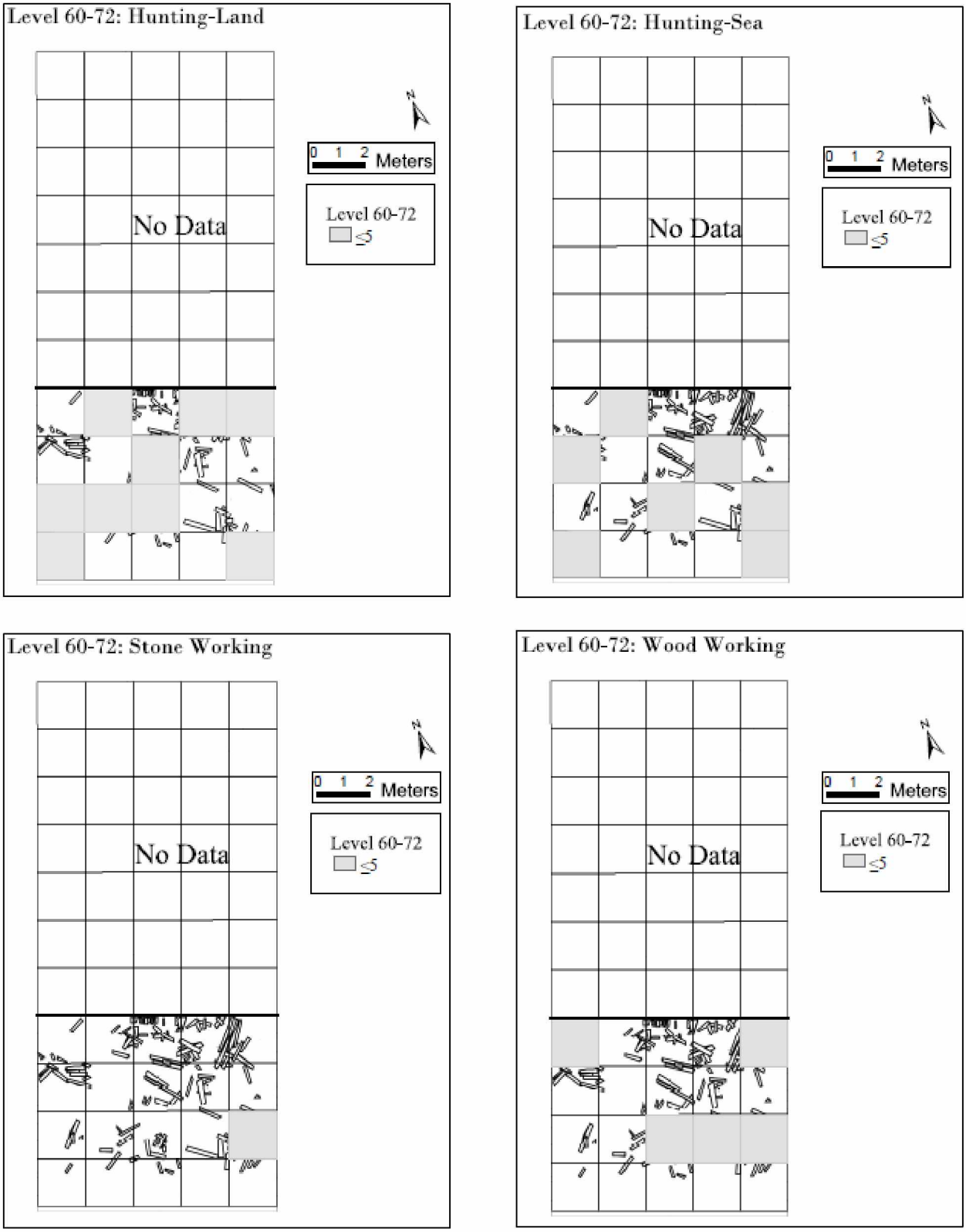
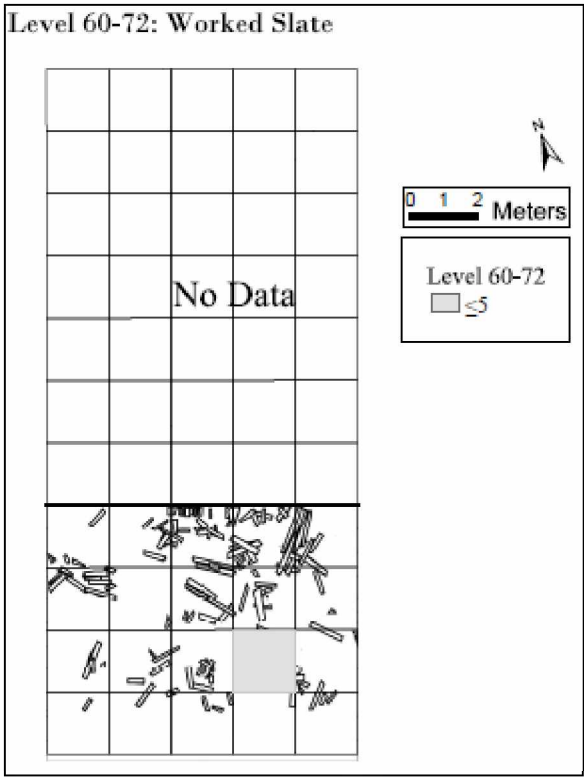


Figure A. 7.1 Level 60-72 (in) Density Models and Wood Layer. Continues to Next Page.



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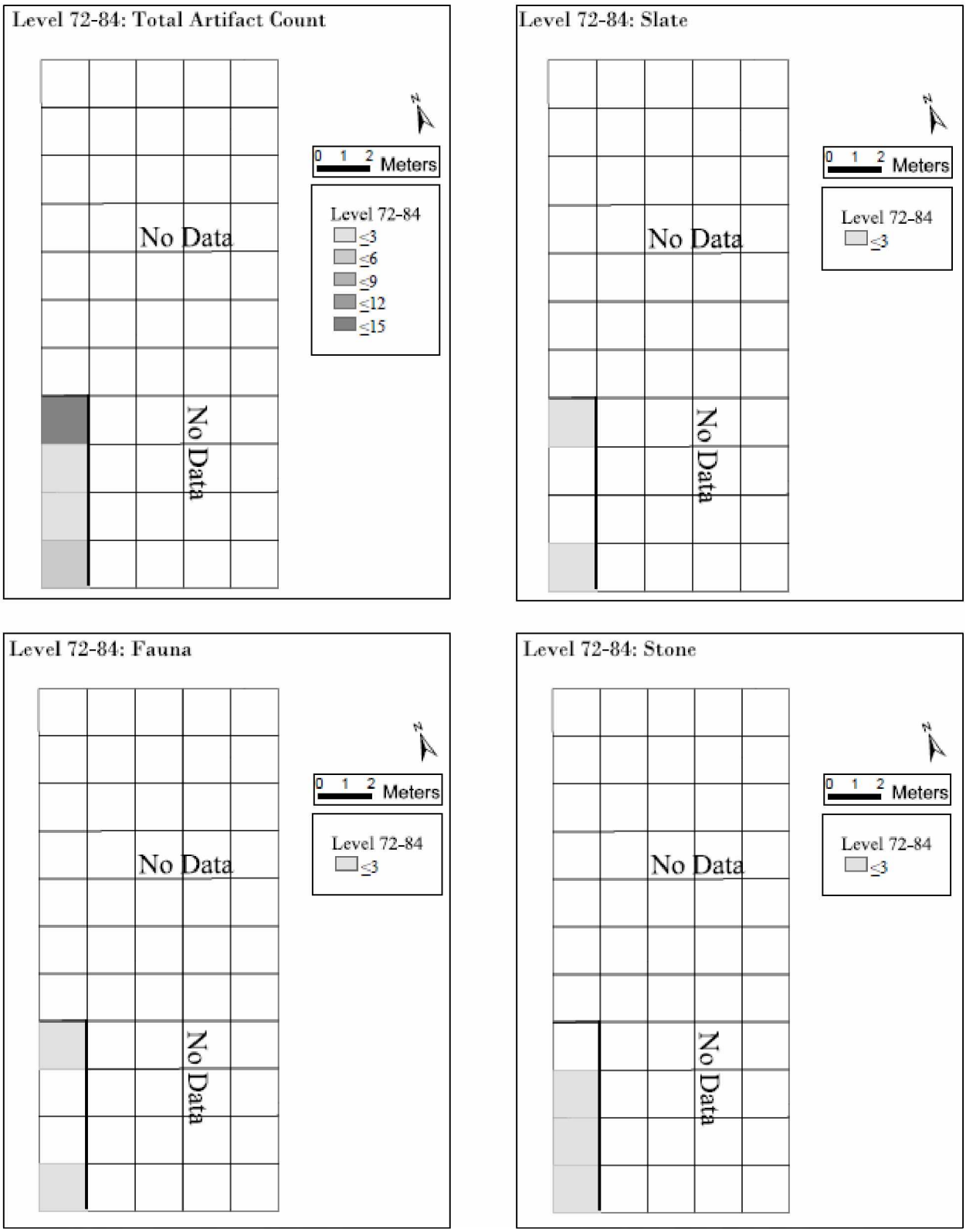
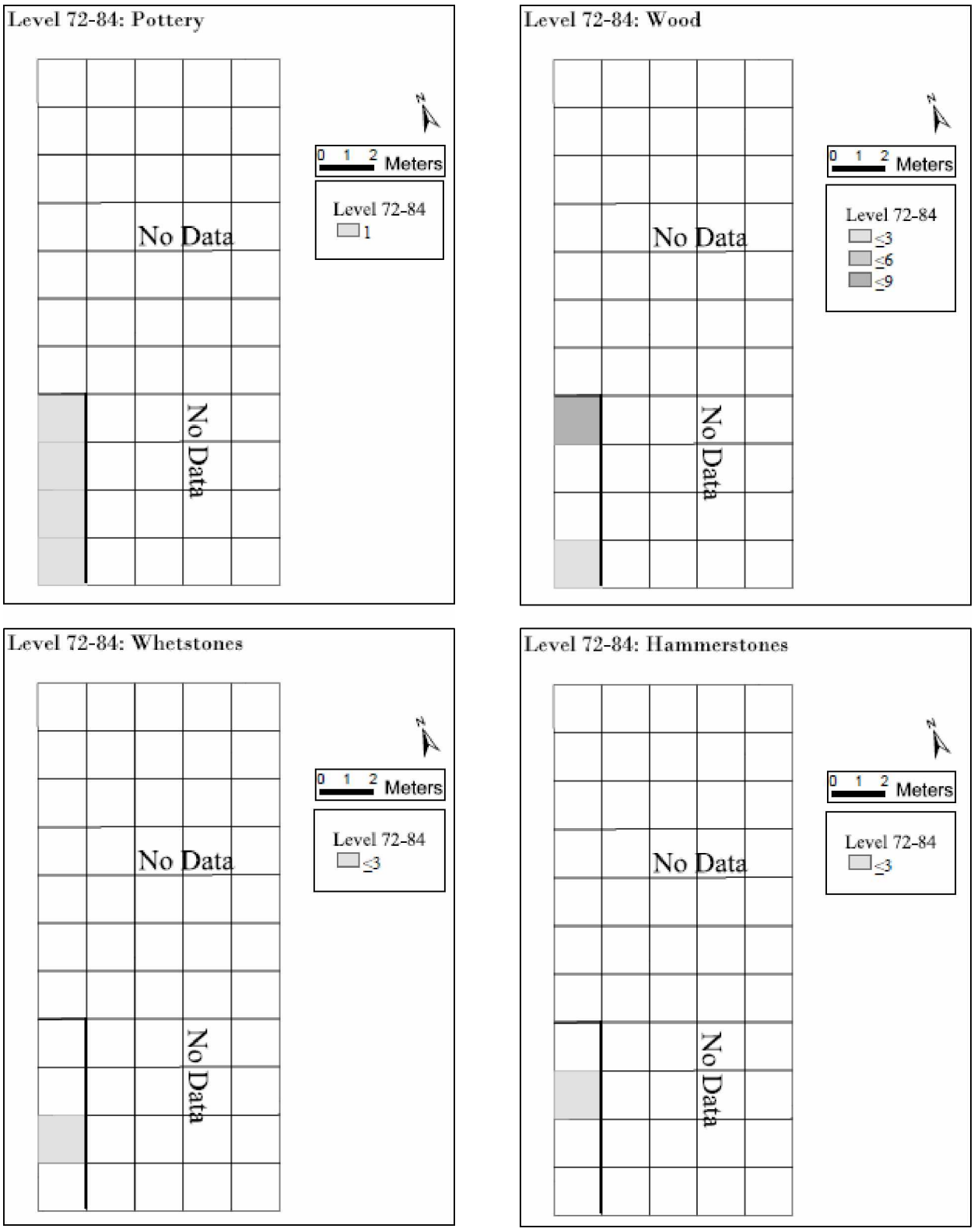


Figure A. 8.1 Level 72-84 (in) Density Models. Continues to Next Page.



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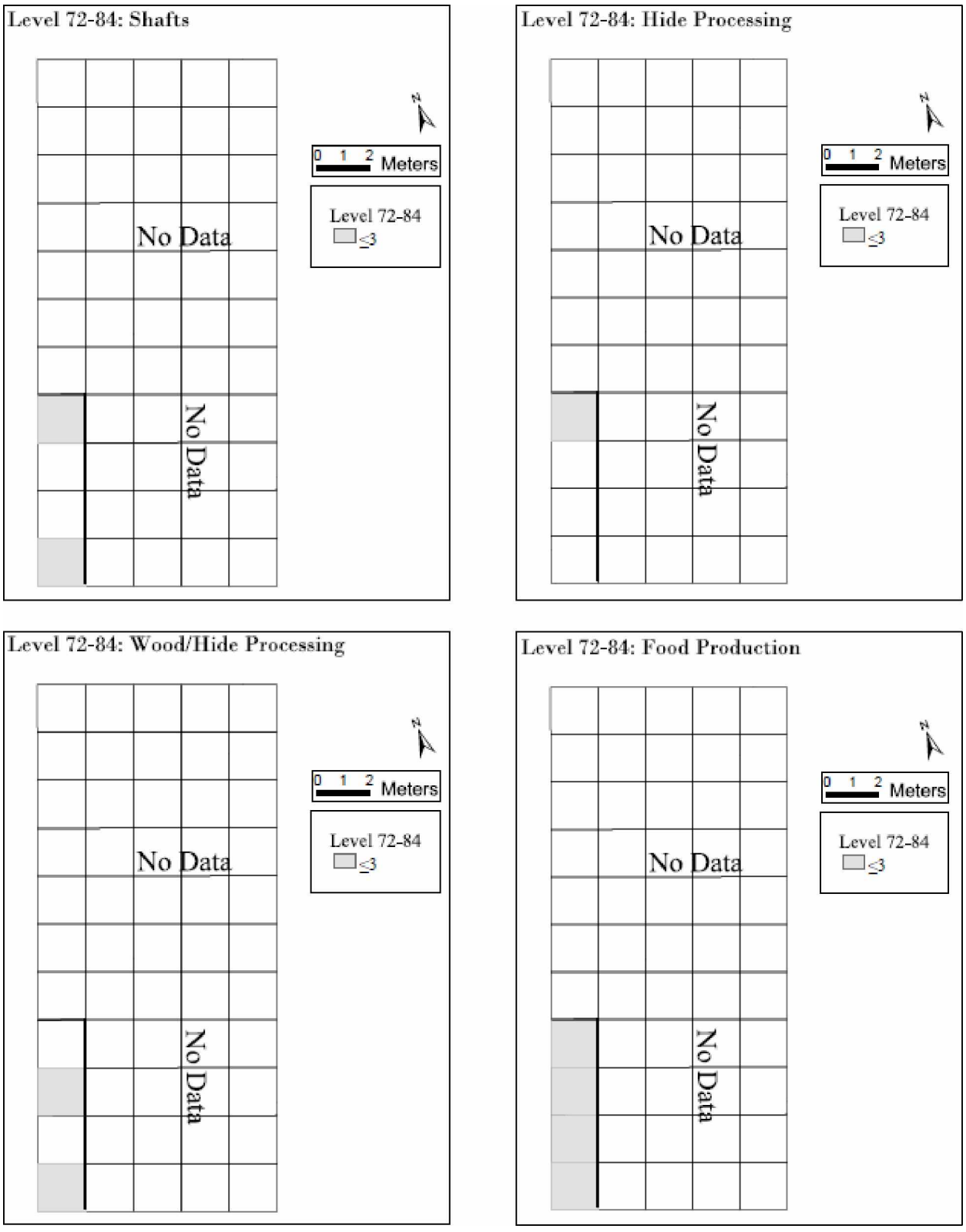

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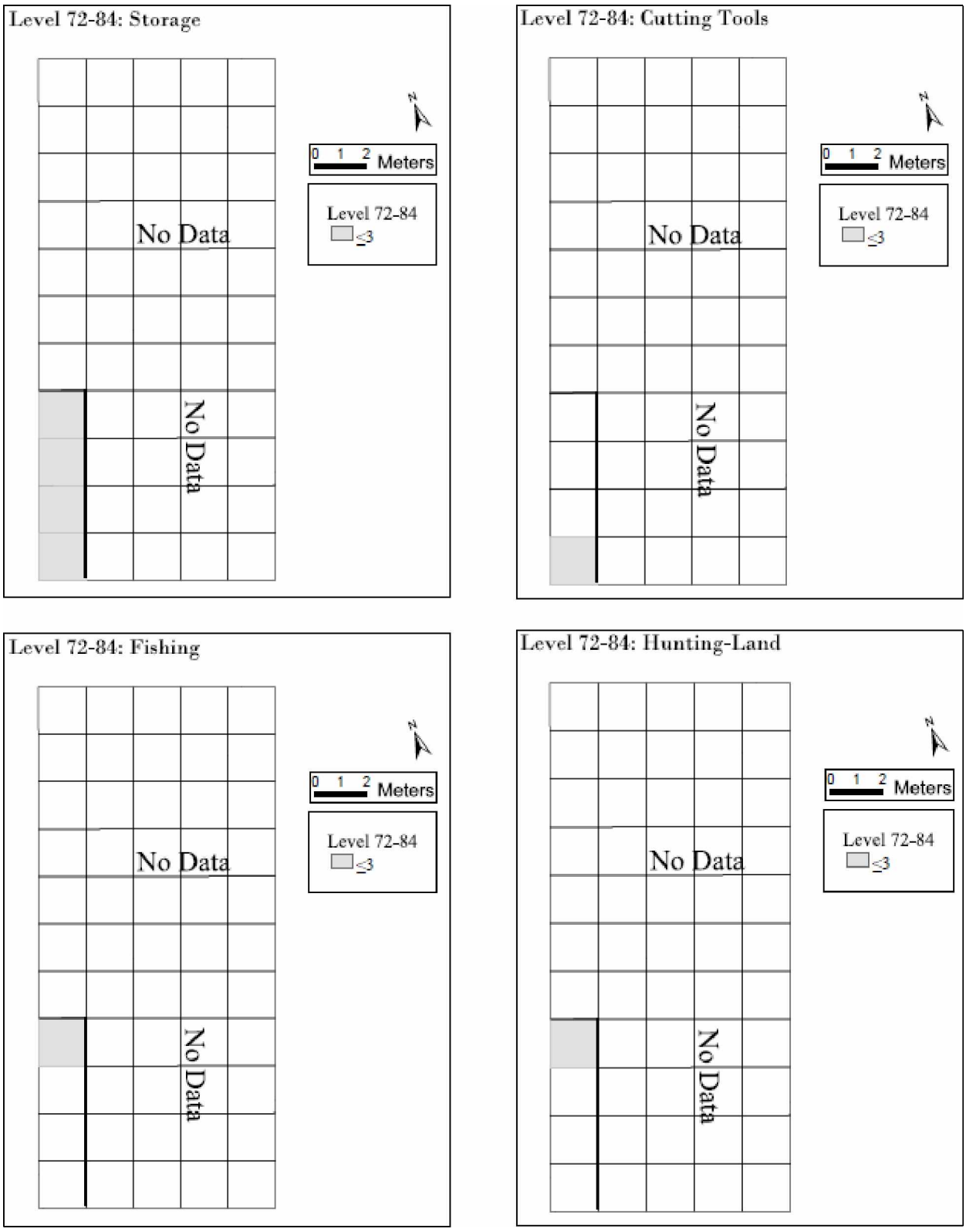

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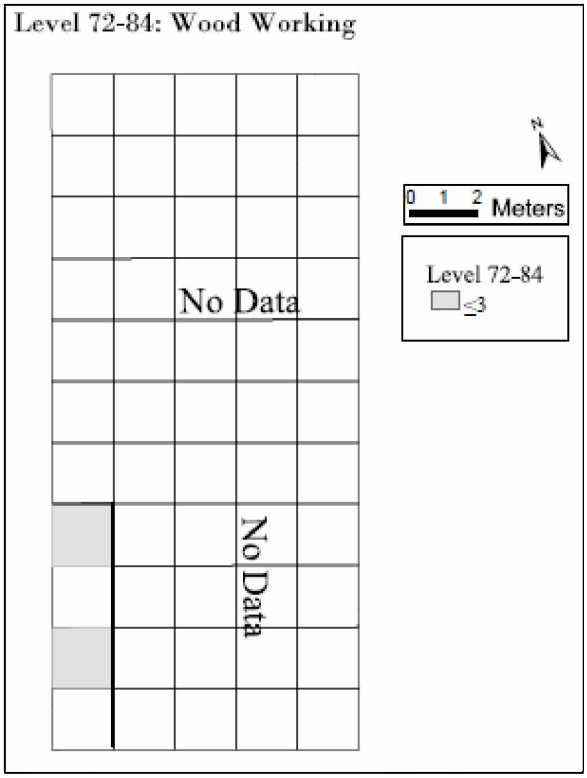


Figure A. 8.5 Level 72-84 (in) Density Models.

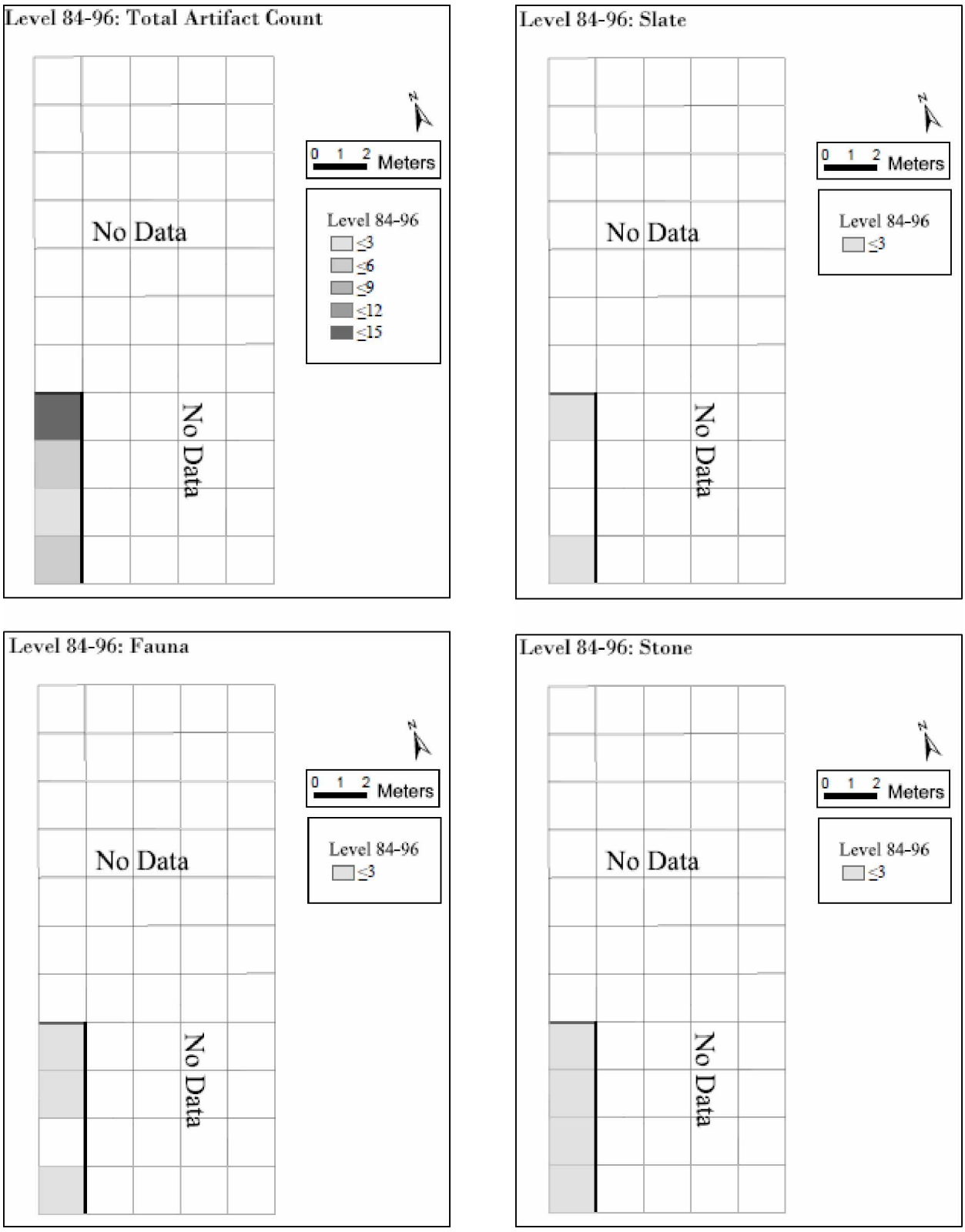
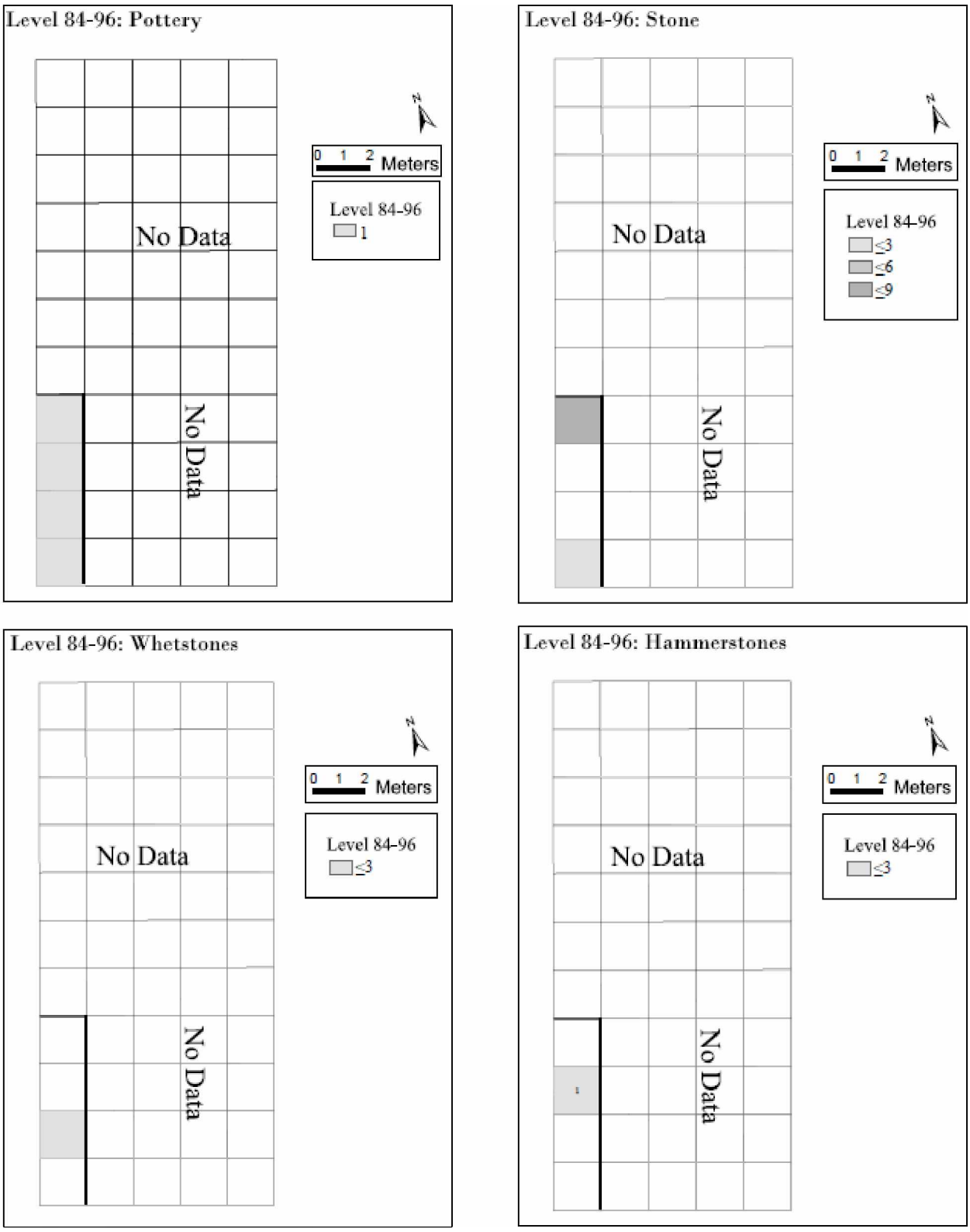


Figure A. 9.1 Level 84-96 (in) Density Maps. Continues to Next Page.



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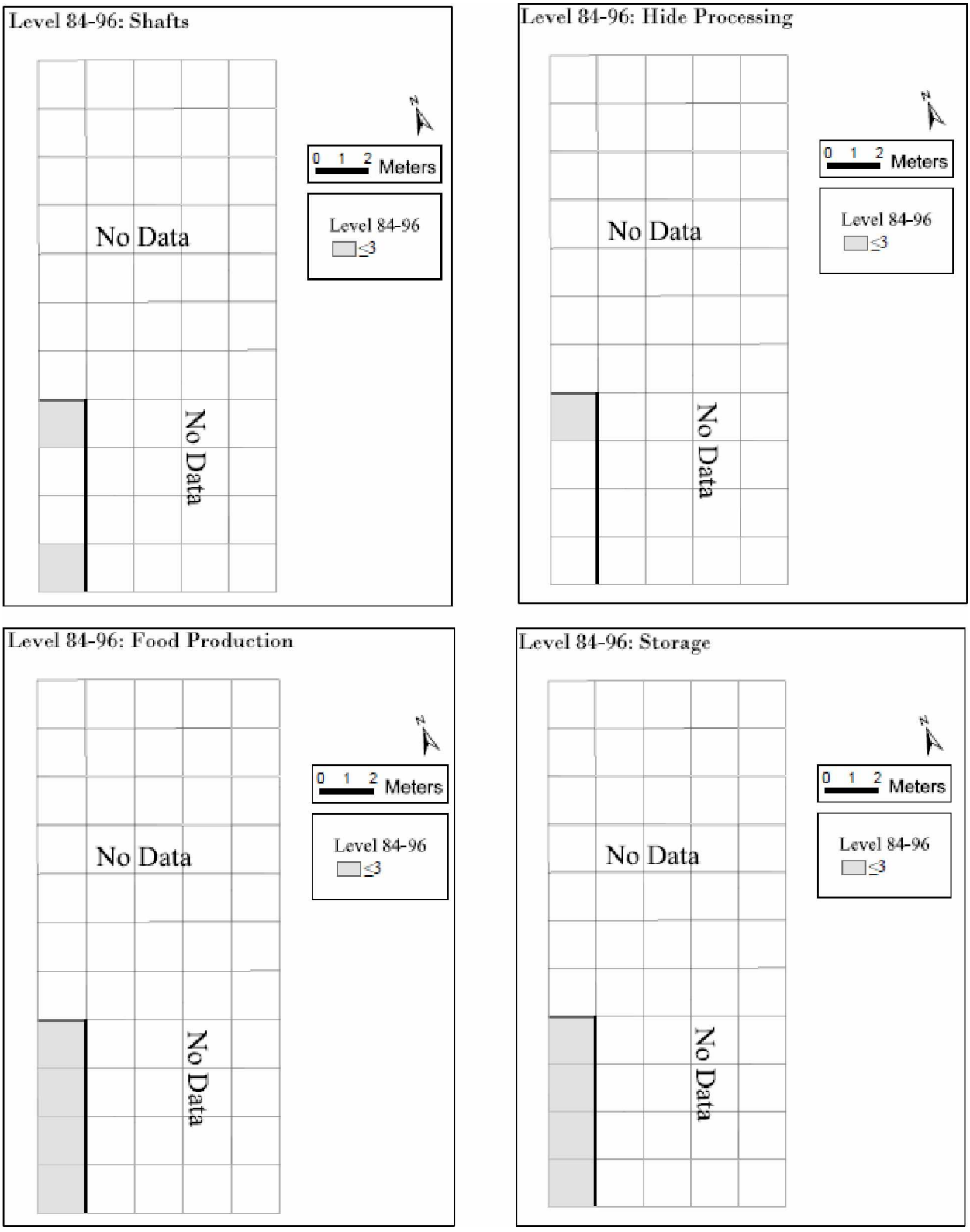

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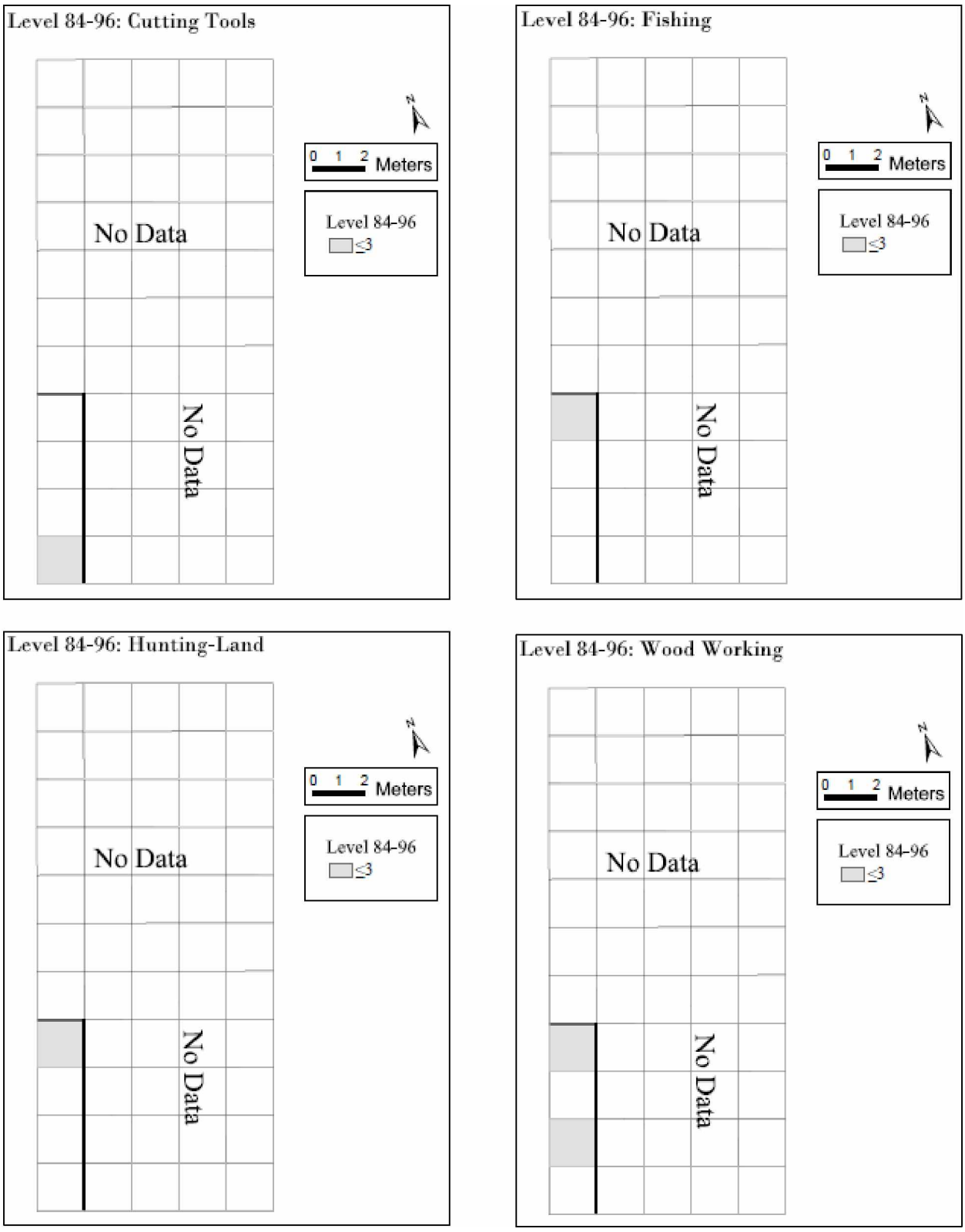

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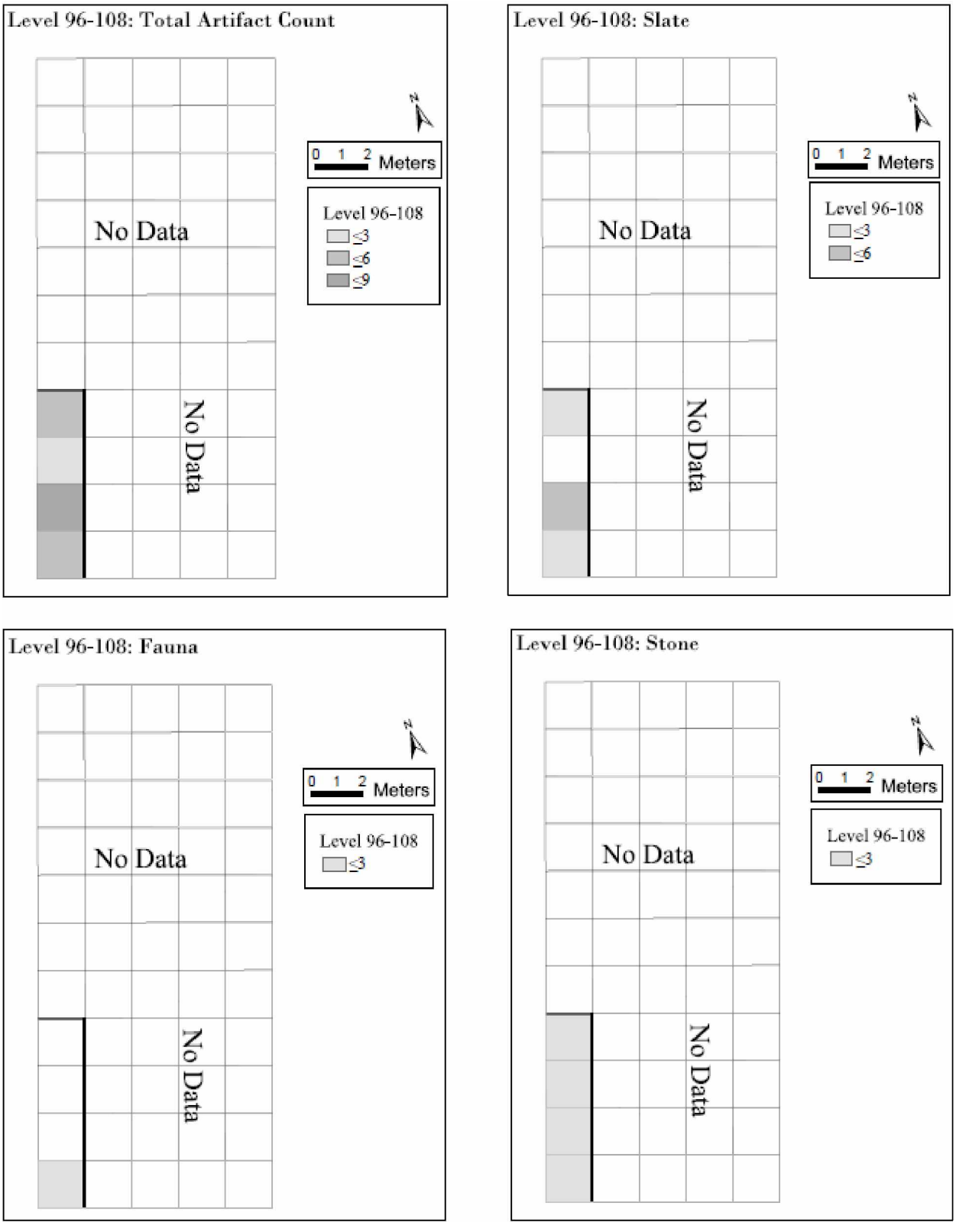
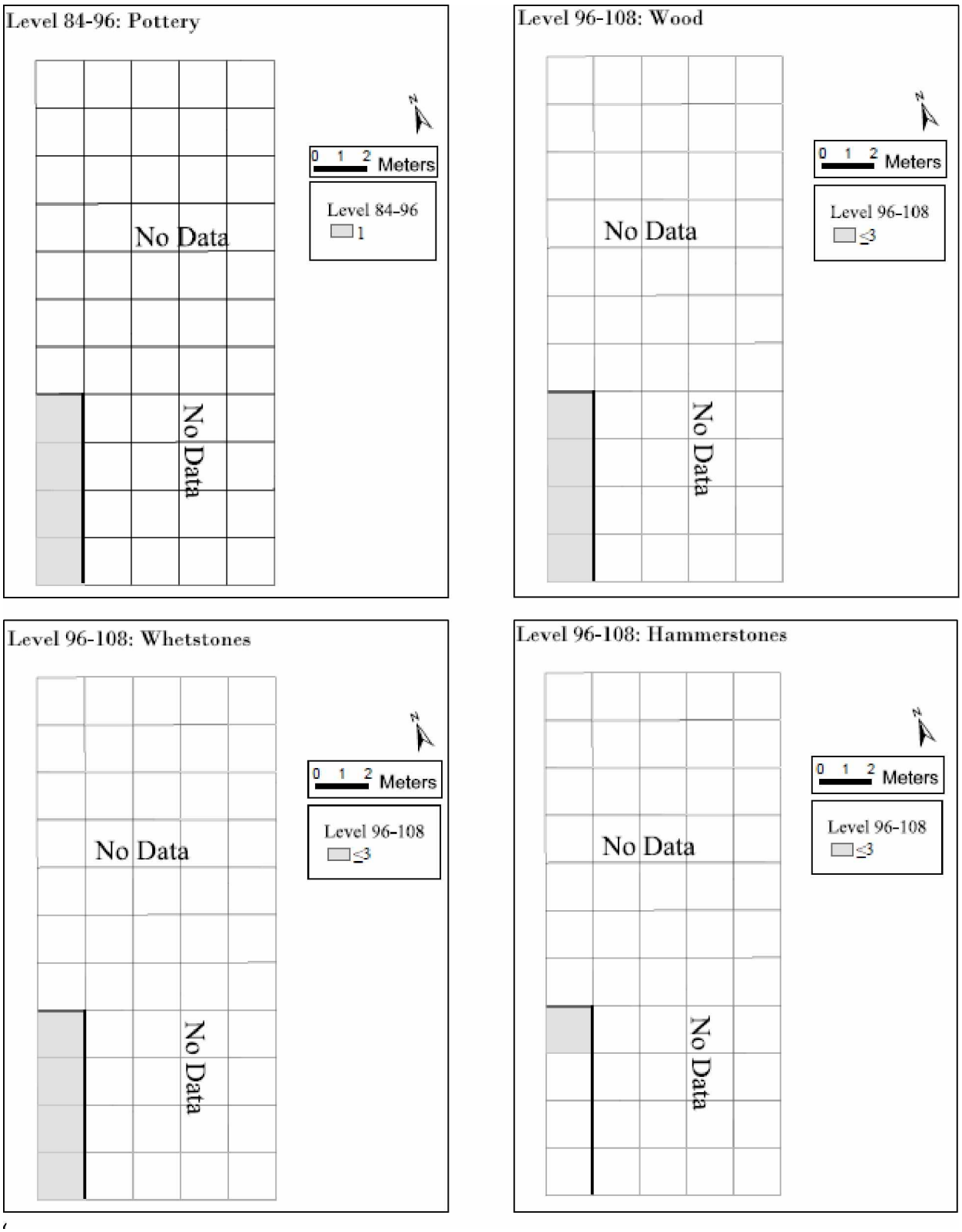


Figure A. 10.1 Level 96-108 (in) Density Maps. Continues to Next Page.



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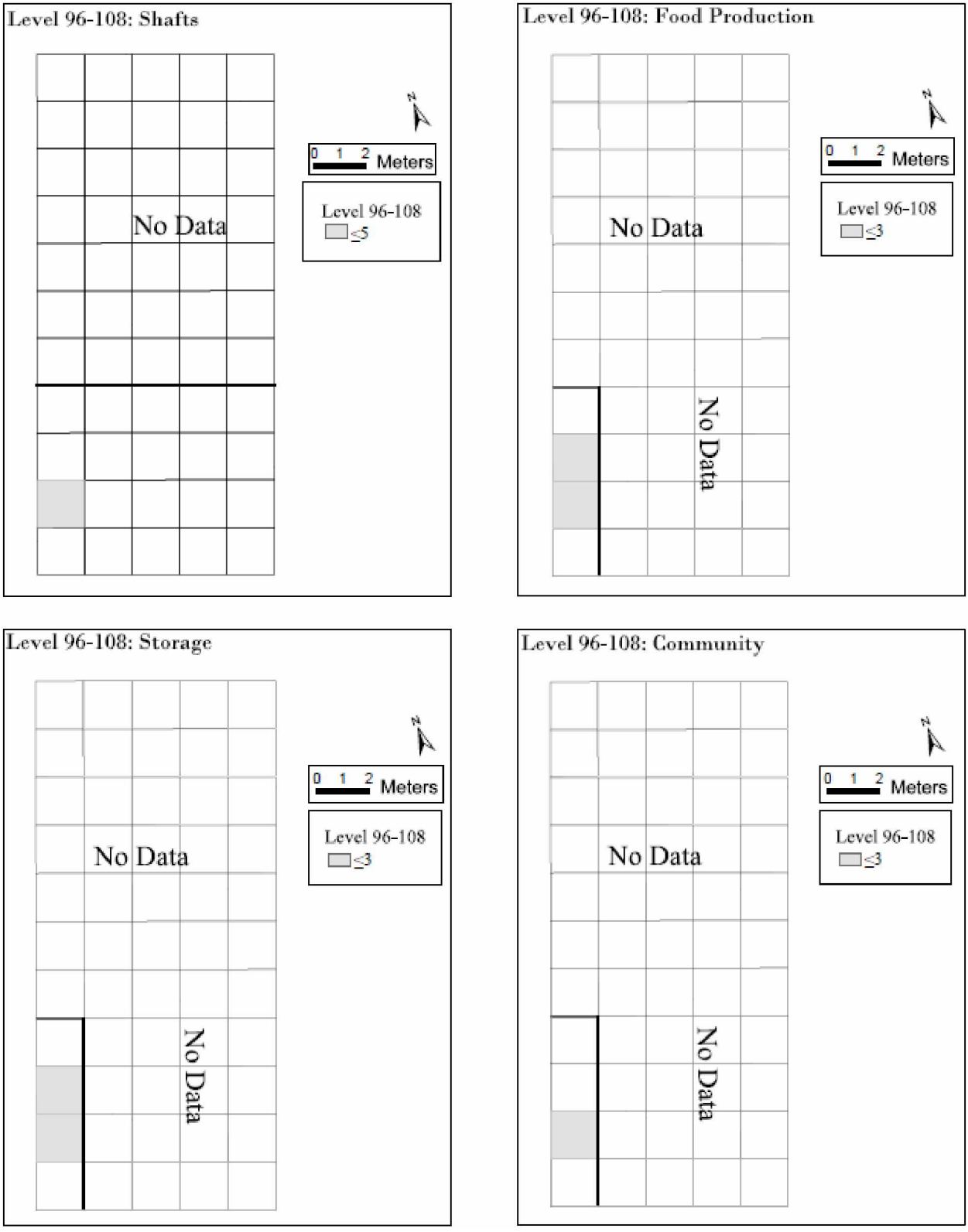


Figure A. 10.1 Level 96-108 (in) Density Maps. Continues to Next Page.

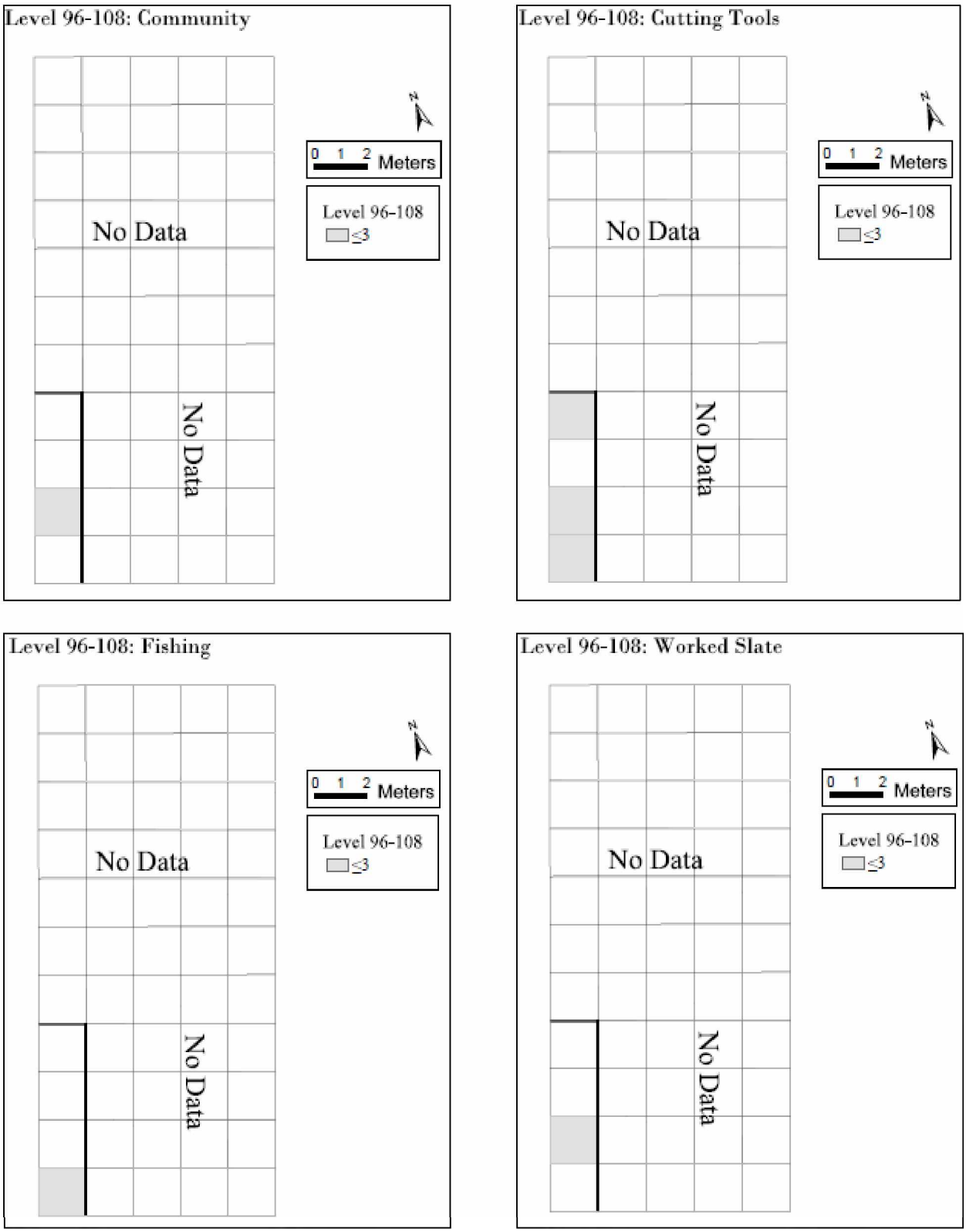


Figure A. 10.1 Level 96-108 (in) Density Maps.

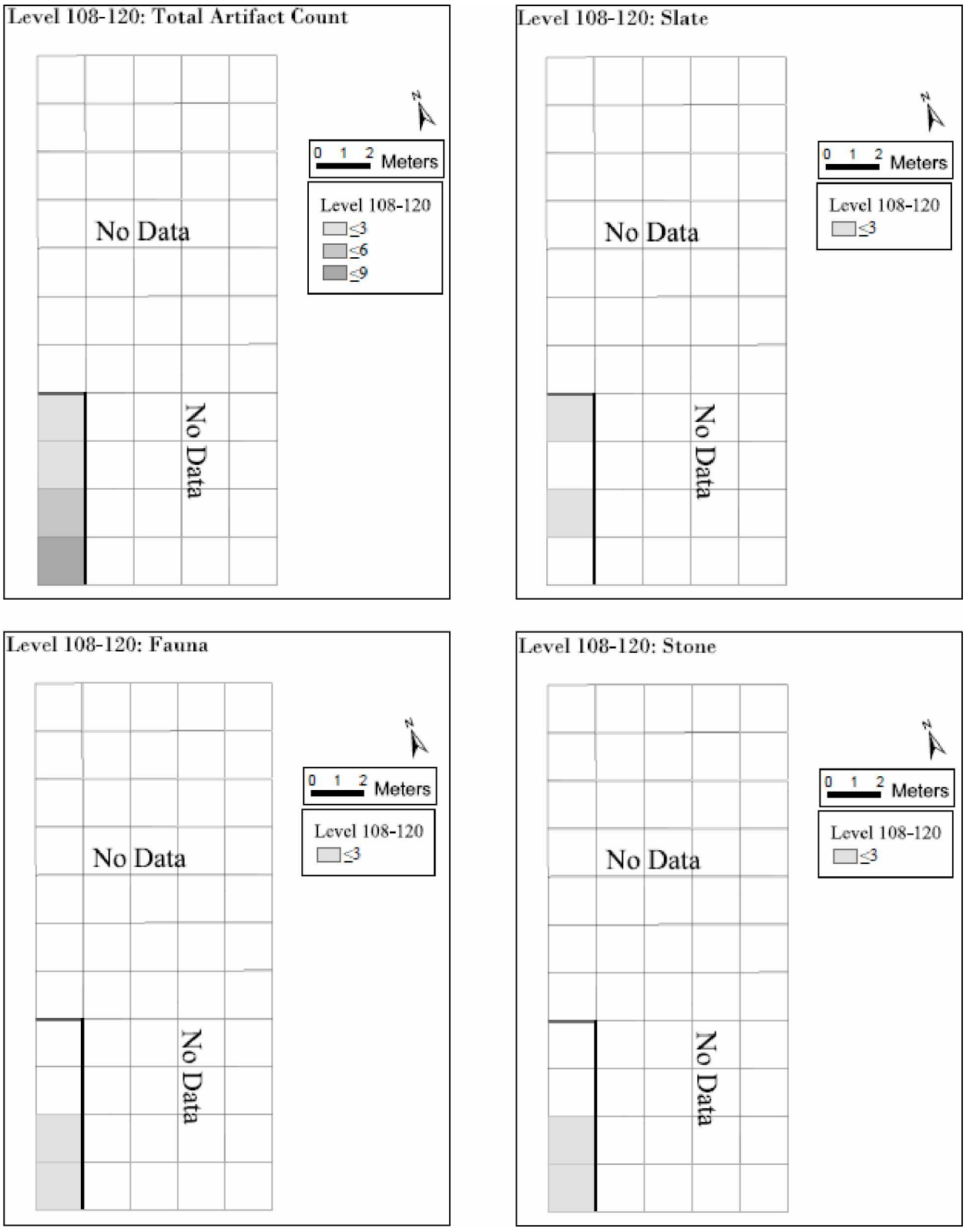
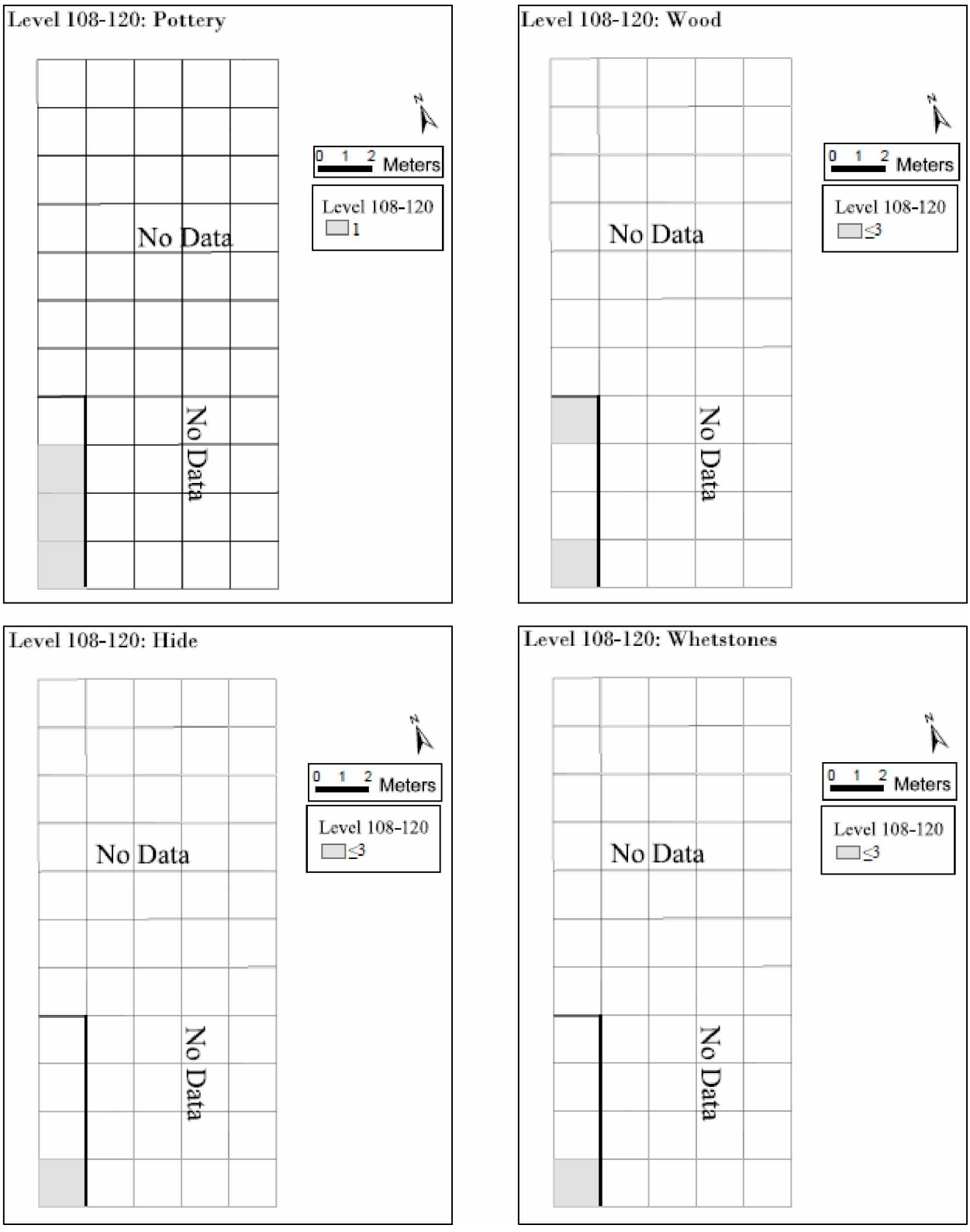


Figure A. 11.1 Level 108-120 (in) Density Maps. Continues to Next Page.



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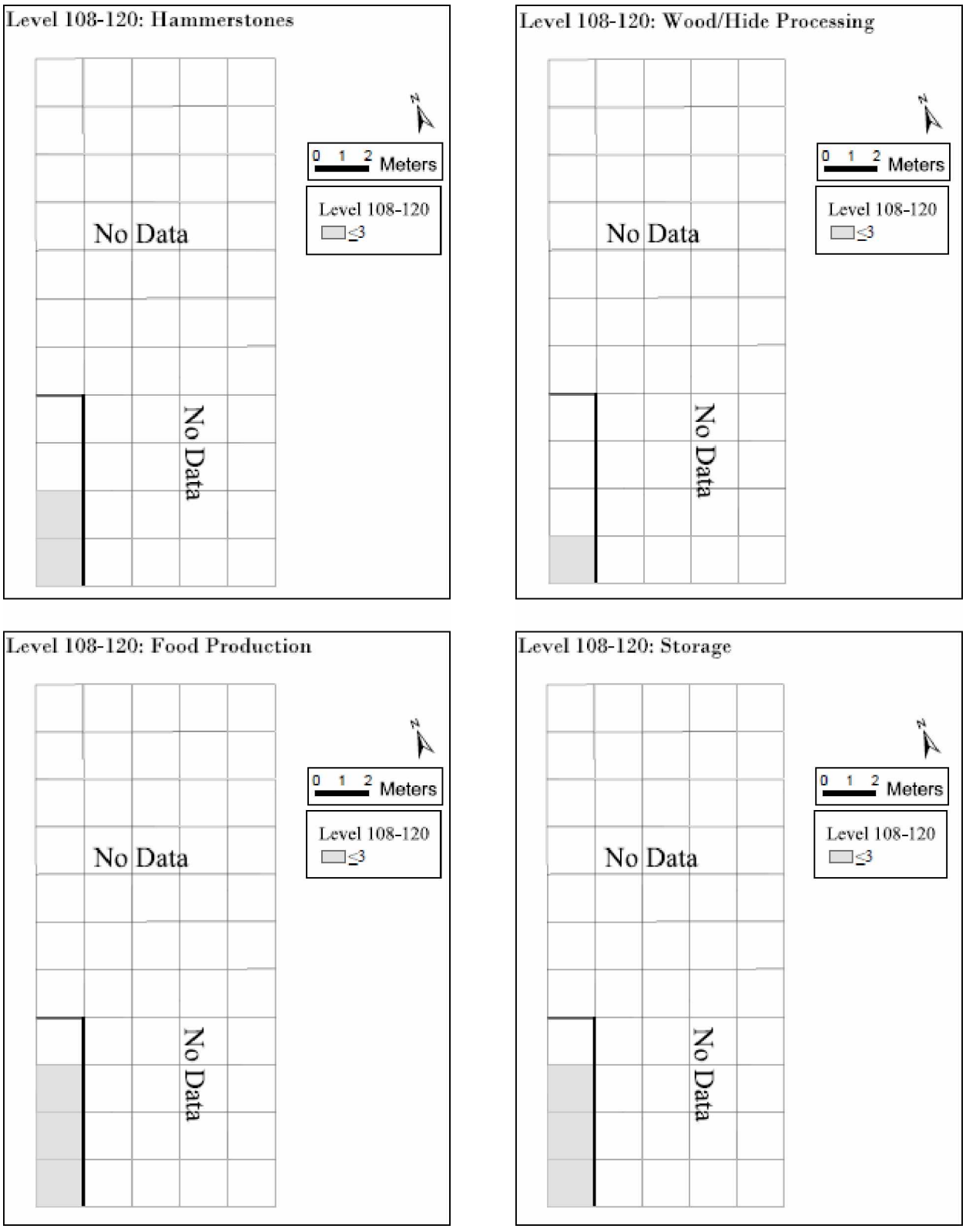

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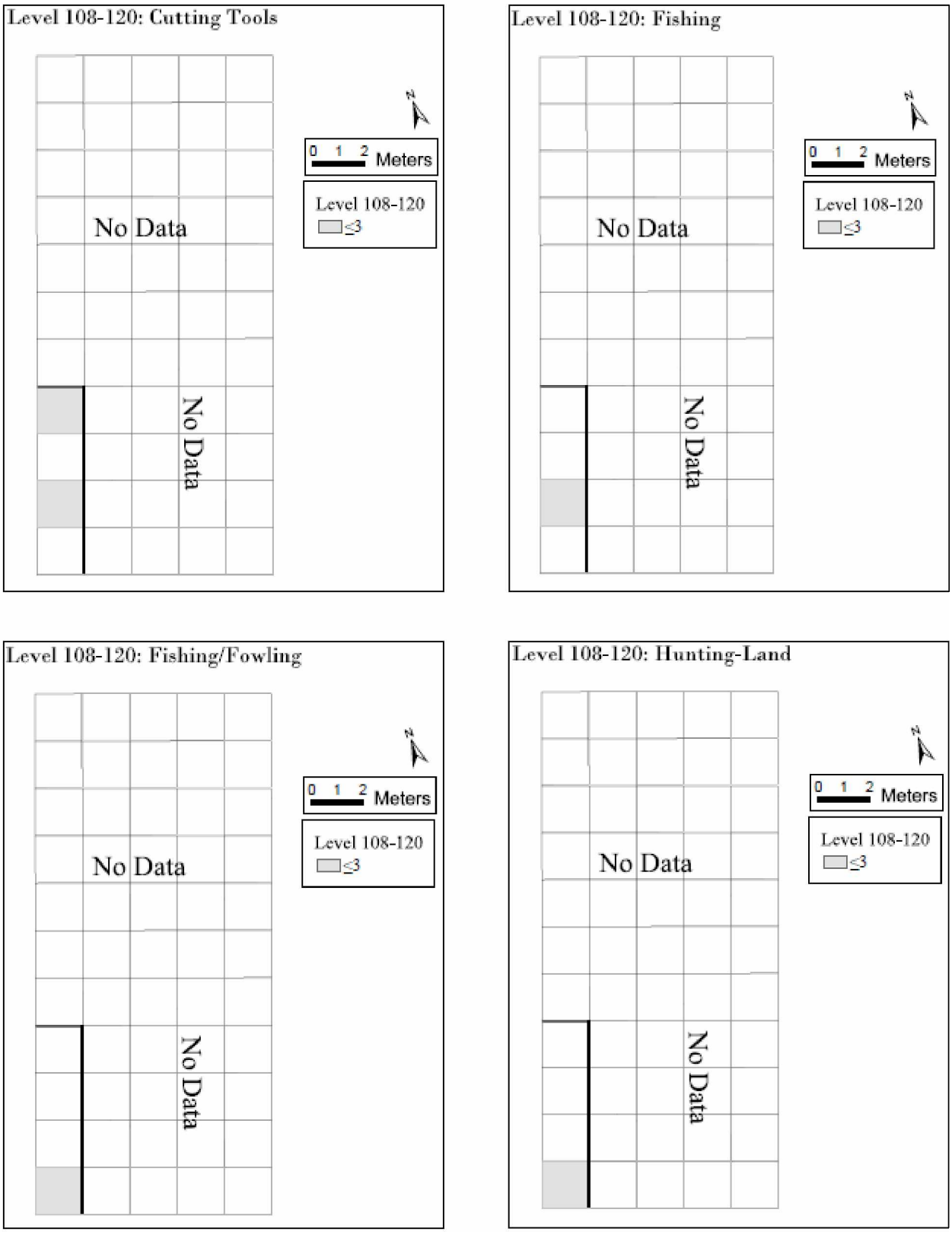

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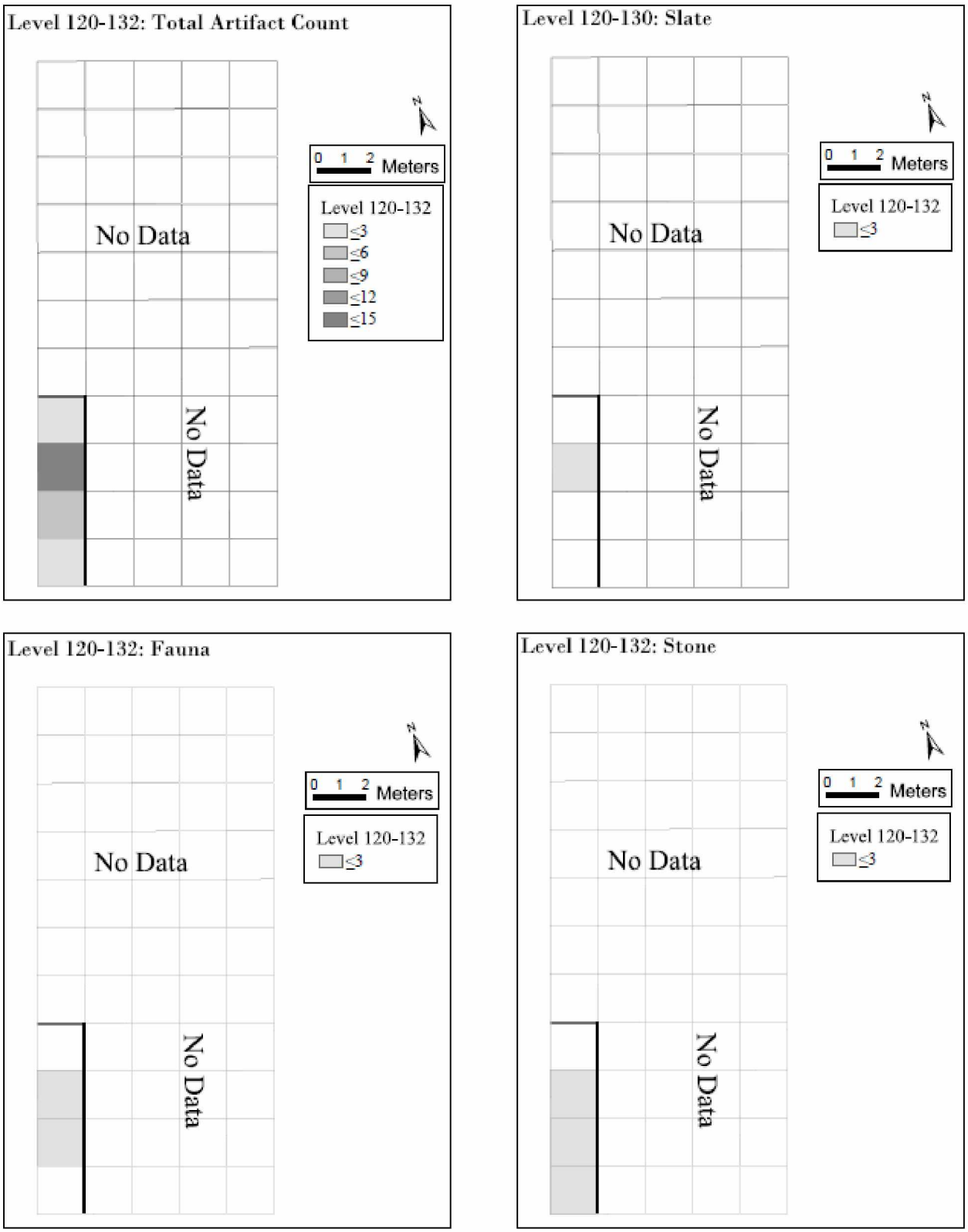

Figure A. 12.1 Level 120-132 (in) Density Maps. Continues to Next Page.

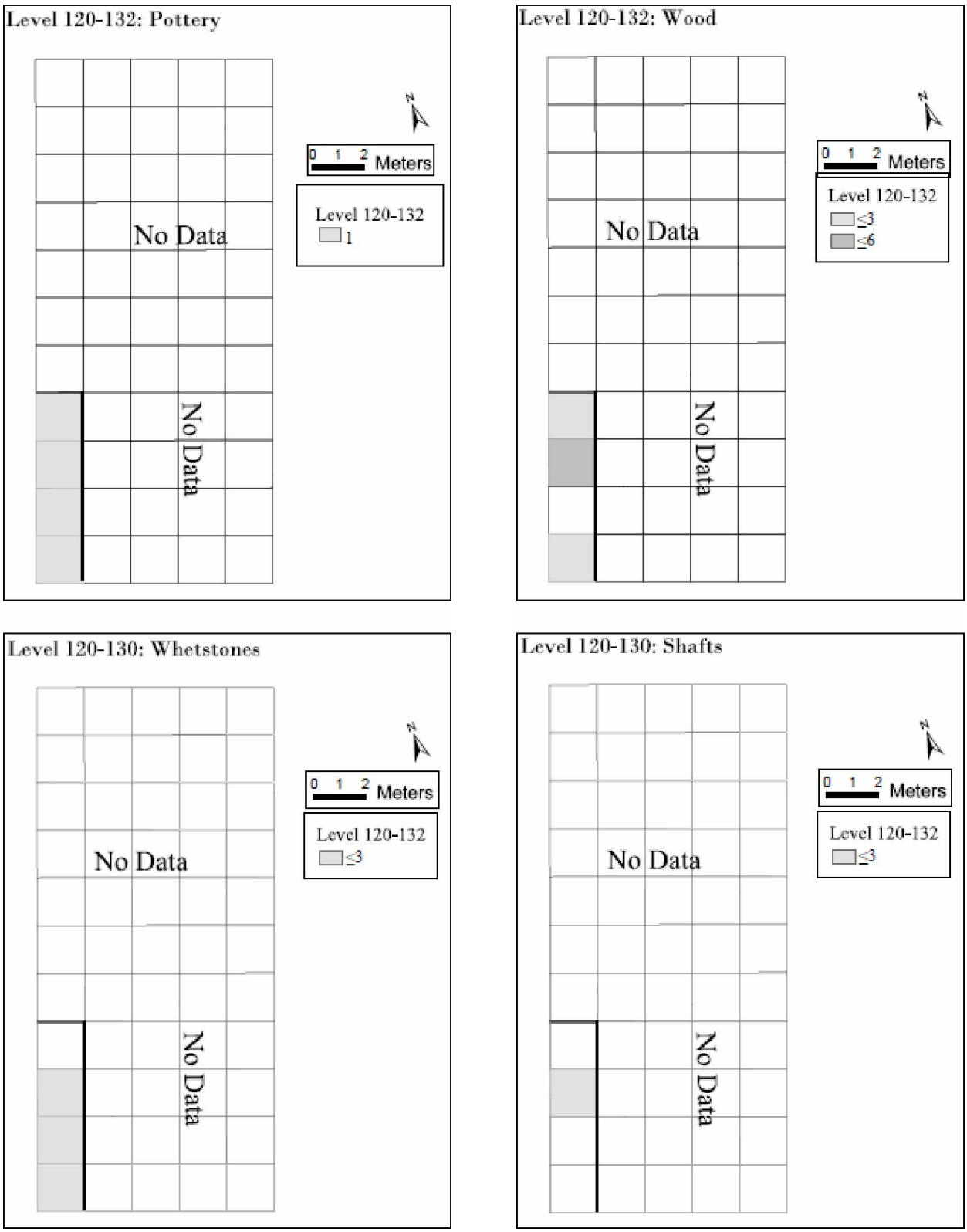

Figure A. 12.1 Level 120-132 (in) Density Maps. Continues to Next Page.

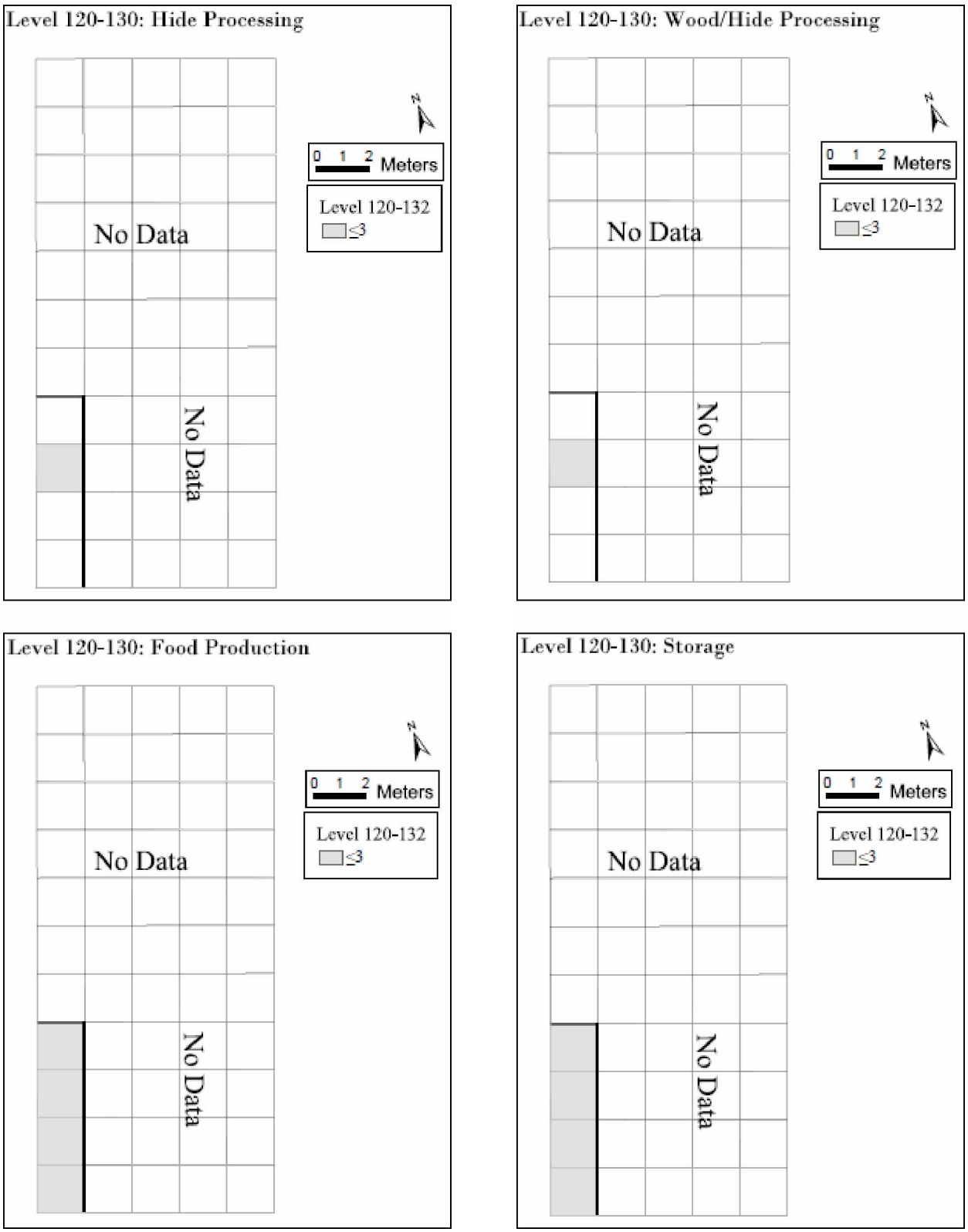

Figure A. 12.1 Level 120-132 (in) Density Maps. Continues to Next Page.

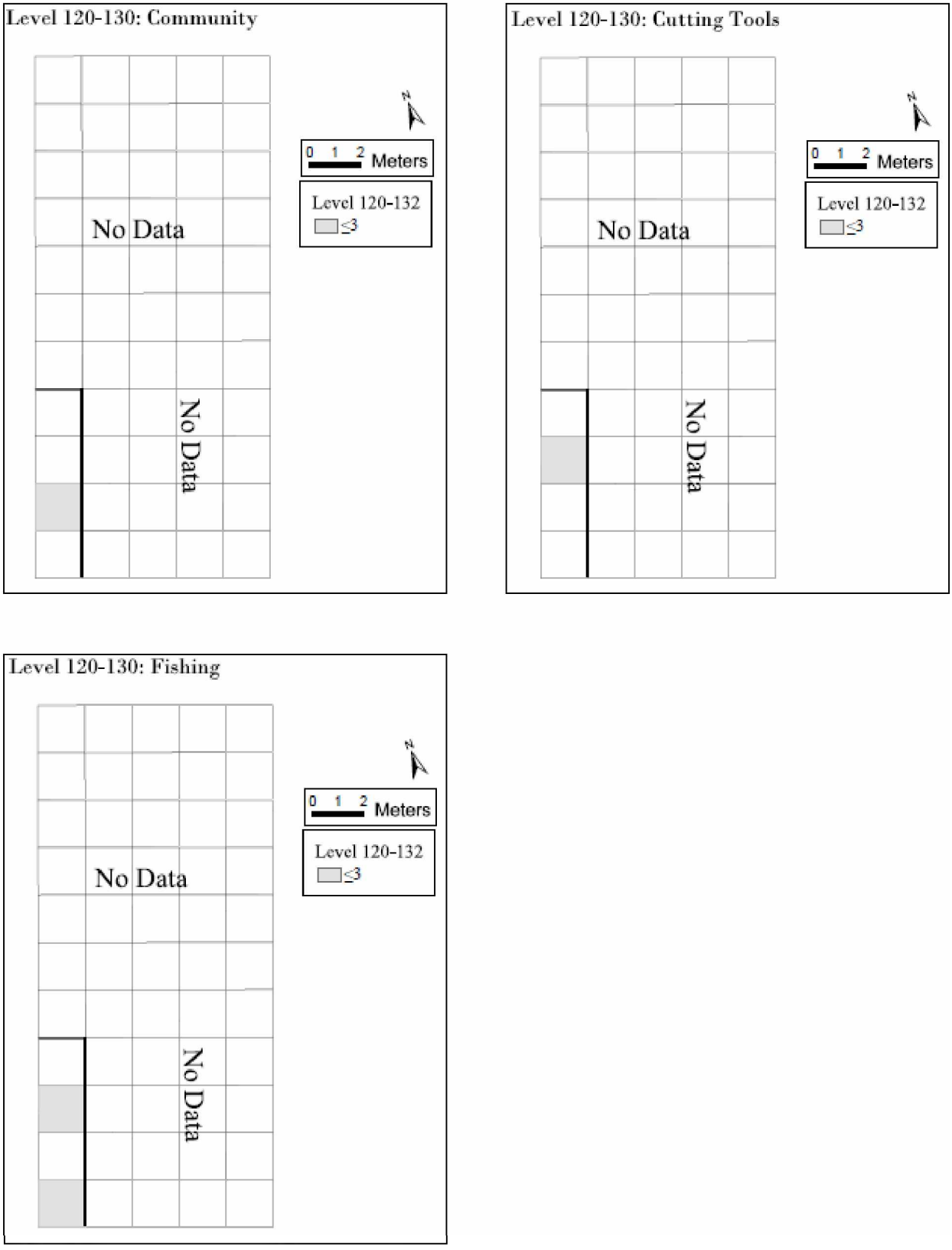

Figure A. 12.1 Level 120-132 (in) Density Maps.

Appendix B:
IRB Approval

(907) 474-7800
(907) 474-5444 fax
uaf-irb@alaska.edu
www.uaf.edu/irb

Institutional Review Board
909 N Koyukuk Dr. Suite 212, P.O. Box 757270, Fairbanks, Alaska 99775-7270

April 12, 2017

To: Sveta Yamin-Pasternak
Principal Investigator
From: University of Alaska Fairbanks IRB
Re: [1042039-2] Temyiq Tuyuryak: Reassessing Museum Collections in Collaboration with Traditional Knowledge

Thank you for submitting the Response/Follow-Up referenced below. The submission was handled by Expedited Review under the requirements of 45 CFR 46.110, which identifies the categories of research eligible for expedited review.

Title:	Temyiq Tuyuryak: Reassessing Museum Collections in Collaboration with Traditional Knowledge
Received:	April 12, 2017
Expedited Category:	7
Action:	APPROVED
Effective Date:	April 12, 2017
Expiration Date:	April 12, 2018

This action is included on the May 3, 2017 IRB Agenda.

No changes may be made to this project without the prior review and approval of the IRB. This includes, but is not limited to, changes in research scope, research tools, consent documents, personnel, or record storage location.